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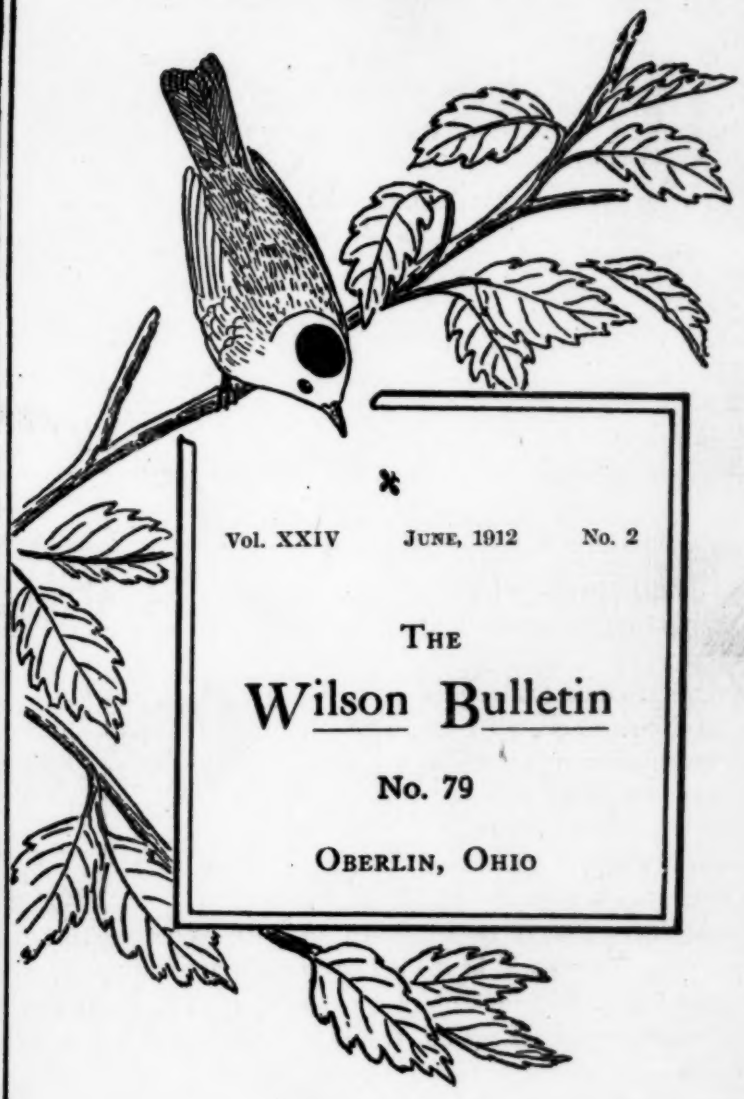

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Figure 1. The blind in position at the thrasher nest. The nest is midway between the blind and the box to the left. The slit in the blind is the opening through which the birds were watched.

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WILSON BULLETIN
NO. 79.
A QUARTERLY JOURNAL OF ORNITHOLOGY
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A STUDY OF THE HOME LIFE OF THE BROWN THRASHER, *TOXOSTOMA RUFUM.* (Linn.)

BY IRA N. GABRIELSON.

Introduction.

The observations on which this paper is based were made during the summer session, 1911, of the Iowa Lakeside Laboratory, on Lake Okoboji, Iowa. The plan followed was that first successfuly employed by Prof. F. H. Herrick, namely, of erecting a blind at the nest and studying the birds at close range. The aim of the work was to record the feeding activity for several consecutive days, particularly from the economic standpoint.

The problem was suggested by Prof. T. C. Stephens, of Morningside College, to whom I wish to express my gratitude for much help and many valuable suggestions in carrying on the work and in preparing this report. I also wish to thank Prof. T. H. MacBride for the opportunity of attending this session of the Laboratory. The plan could not have been carried out without the help given by the workers in the Laboratory, and to the following persons particularly my thanks are due for assistance in carrying out the study: Miss Hochstetler, Miss Mae Gittens, Miss Gladys Price, Miss Mildred Sykes, Miss Idylene Tovey, Miss Harriet Wilson, Miss Alice Yocum, and Mr. A. H. Schatz. My thanks are due Miss Pearl A. Woodford, of Morningside College, for help in preparing this paper.

The blind used was very simple and one easily made. It was constructed of a sign umbrella held in position by three guy ropes. The wall of muslin dyed grey was in one piece and was fastened over the ends of the umbrella ribs by a draw string. The bottom was staked down and the blind was ready for use. Figure 1 is a photograph of the blind as it appeared at the thrasher nest.

The nest chosen for study was that of a Brown Thrasher (*Toxostoma rufum*). It was built on the ground, which is rather an unusual nesting site for this species. The grass had been quite long, but had been cut, leaving the nest in a very exposed position. When first discovered on June 17, it contained four young, not more than twenty-four hours old, and one addled egg. The blind was placed in position on the morning of the 23d. Within an hour the parent birds had become completely reconciled to its presence and were using the guy ropes for a perch. Soon after the study was commenced it was noticed that one of the birds had a conspicuous white spot on the back of the head and, after watching an hour or two, it was decided that this bird was the female. This white mark furnished a sure means of determining the sex of the parent feeding. It is visible in figure 2 and 3.

TABLE I.

The data in Table I is simply a condensed form of the records of feeding as they were taken in the blind. The first column contains the number of the feeding (all the feedings from the first to the last day of observation are numbered consecutively). The second column contains the sex of the parent feeding; the third the time of day; the fourth the character and amount of food; the fifth the nestling receiving the food; and the last one the data on sanitation.

Data for June 23, 1911. From 12:45 to 5:45 p. m.

No.	Sex.	Time.	Food.	Young fed.	Excreta.
1.	m	12:45	4 white moths, 2 small insects.		
2.	f	12:48	Did not feed.		
3.	m	12:50	1 grasshopper.		
4.	f	12:54	2 grasshoppers.		
5.	f	12:55	1 grasshopper.		
6.	m	12:59	1 grasshopper, several (2) crickets.		devoured.
7	f	1:06	1 mayfly, 5 white moths.		

Figure 2. The female feeding the young. The white spot on the head is visible in this figure.

No.	Sex.	Time.	Food.	Young fed.	Excreta.
8.	f	1:25	1 maybeetle.		
9.	f	1:48	1 grasshopper.		
10.	m	1:49	2 unknown bugs.		
11.	f	1:53	1 grasshopper.		devoured.
12.	f	1:55	1 white moth.		
13.	m	1:56	3 white moths.		
14.	f	2:00	1 maybeetle.		
15.	f	2:10	2 white moths, 1 grey moth.		
16.	f	2:23	1 green worm.		
17.	f	2:26	2 grasshoppers.		
18.	m	2:30	2 grasshoppers.		devoured.
19.	m	2:34	1 unknown.		
20.	f	2:34	1 cutworm.		devoured.
21.	m	2:45	3 green worms.		
22.	m	2:55	1 cutworm, 1 grasshopper.		
23.	f	3:10	1 white moth, 1 larva.		
24.	f	3:16	1 cutworm.		
25.	m	3:21	1 grasshopper.		devoured.
26.	m	3:25	1 dragonfly.		
27.	m	3:35	1 cutworm, 1 white moth.		devoured.
28.	f	3:36	1 butterfly.		
29.	m	3:40	3 white moths, 1 grasshopper.		
30.	m	3:48	1 brown larva.		
31.	f	3:50	1 centipede.		
32.	f	3:53	1 cutworm.		
33.	f	4:04	1 grasshopper.		
34.	f	4:10	1 cutworm.		
35.	f	4:15	3 green worms, 1 cutworm, 1 fly.		
36.	m	4:19	1 centipede, 1 cutworm.		
37.	f	4:25	1 large green worm.		devoured.
38.	f	4:30	1 mayfly.		devoured.
39.	m	4:31	1 large brown moth.		
40.	f	4:32	1 large white moth, 1 cutworm.		
41.	f	4:38	2 grasshoppers, 1 moth.		
42.	m	4:45	1 large brown moth.		
43.	m	4:47	4 grasshoppers.		devoured.
44.	f	4:48	1 mayfly.		
45.	f	4:55	2 mayflies.		
46.	m	4:58	1 cutworm, 1 spider.		
47.	m	5:05	2 grasshoppers.		
48.	m	5:10	1 grasshopper.		
49.	f	5:11	1 beetle.		
50.	f	5:13	2 grasshoppers.		
51.	m	5:15	1 mayfly, 1 moth.		
52.	f	5:19	2 grasshoppers.		
53.	m	5:19	1 spider.		devoured.
54.	f	5:22	1 grasshopper.		
55.	m	5:23	2 moths.		devoured.
56.	f	5:35	1 grasshopper, 1 cutworm, 1 unknown.		
57.	m	5:40	1 grasshopper.		devoured.
58.	f	5:42	1 cutworm.		

Data for June 24, 1911. From 12:45 to 6:00 p. m.

No.	Sex.	Time.	Food.	Young fed.	Excreta.
59.	f	12:50	3 grasshoppers.		
60.	f	12:58	2 white moths.		
61.	m	1:01	1 grasshopper.		
62.	m	1:09	2 mayflies.		
63.	f	1:10	2 cutworms.		devoured.
64.	m	1:13	1 grasshopper.		
65.	f	1:28	2 mayflies.		
66.	m	1:49	1 grasshopper.		
67.	f	1:52	1 grasshopper, 1 mayfly.		
68.	f	1:55	1 grasshopper.		
69.	m	1:56	2 green worms.		
70.	f	1:57	1 grasshopper.		
71.	f	2:04	1 cutworm.		
72.	f	2:05	1 mayfly.		
73.	f	2:07	2 beetles.		
74.	m	2:43	1 mayfly, 1 grasshopper, 1 green worm.		
75.	f	2:16	1 grasshopper.		
76.	m	2:19	1 beetle.		devoured.
77.	m	2:24	1 grasshopper.		
78.	f	2:29	1 grasshopper.		
79.	f	2:30	1 mayfly.		
80.	f	2:32	1 beetle.		
81.	f	2:34	1 grasshopper.		
82.	m	2:35	2 mayflies.		
83.	m	2:38	1 grasshopper.		devoured.
84.	f	2:41	1 grasshopper.		
85.	f	2:43	1 mayfly.		
86.	f	2:45	2 grasshoppers.		
87.	f	2:55	2 white moths.		
88.	m	2:55	1 grasshopper.		
89.	f	2:56	1 grasshopper.		
90.	f	3:04	2 grasshoppers.		carried away.
91.	f	3:12	1 unknown worm.		
92.	f	3:13	2 white moths.		
93.	f	3:15	2 mayflies, 1 cutworm.		
94.	f	3:28	2 grasshoppers.		
95.	m	3:32	1 mayfly, 1 grasshopper.		devoured.
96.	m	4:03	2 white moths.		
97.	f	4:03	1 grasshopper, 1 green worm.		
98.	f	4:07	1 grasshopper.		devoured.
99.	f	4:17	2 grasshoppers.		
100.	f	4:18	1 white moth.		
101.	f	4:22	2 mayflies.		
102.	f	4:25	1 mayfly, 1 beetle.		devoured.
103.	m	4:26	1 grasshopper.		carried away.
104.	f	4:30	1 mayfly.		
105.	m	4:36	1 mayfly, 1 grasshopper.		
106.	m	4:47	1 mayfly.		
107.	m	4:54	2 mayflies.		
108.	m	5:00	1 grasshopper.		
109.	f	5:00	2 grasshoppers.		

No.	Sex.	Time.	Food.	Young fed.	Excreta.
110.	m	5:01	2 mayflies.		
111.	m	5:02	1 mayfly,.		
112.	f	5:07	1 mayfly, 1 cutworm, 1 grasshopper.		
113.	m	5:09	1 grasshopper.		
114.	f	5:10	1 white moth.		
115.	m	5:11	1 mayfly.		
116.	m	5:13	1 green worm.		
117.	f	5:19	1 white moth.		
118.	m	5:26	1 grasshopper, 1 beetle, 1 white moth, 1 worm.		
119.	f	5:26	2 grasshoppers.		
120.	m	5:32	1 grasshopper.		
121.	f	5:35	1 fly.		
122.	m	5:36	1 worm.		
123.	f	5:41	1 white moth, 1 spider.		
124.	m	5:42	1 earthworm.		devoured.
125.	f	5:46	1 grassshopper.		
126.	f	5:55	1 spider.		
			Data for June 26, 1911. From 12:45 to 8:40 p. m.		
127.	m	12:55	3 mayflies.		
128.	f	12:58	1 grasshopper.		
129.	m	1:03	1 grasshopper.		carried away.
130.	f	1:03	1 grasshopper.		
131.	m	1:05	1 grasshopper.		carried away.
132.	f	1:07	1 grasshopper.		
133.	m	1:07	1 grasshopper.		
134.	m	1:16	1 grasshopper.		carried away.
135.	f	1:16	1 grasshopper.		carried away.
136.	m	1:24	1 grasshopper.		
137.	f	1:28	1 grasshopper.		
138.	m	1:33	1 mayfly.		
139.	m	1:41	1 grasshopper.		
140.	m	1:44	1 cutworm.		
141.	m	1:49	1 black butterfly.		
142.	f	1:56	1 grasshopper.		
143.	m	2:06	1 grasshopper.		carried away.
144.	m	2:07	1 grasshopper.		carried away.
145.	m	2:12	1 grasshopper.		
146.	f	2:13	1 grasshopper.		
147.	f	2:17	1 grasshopper.		
148.	f	2:19	1 fly.		
149.	m	2:21	1 grasshopper.		
150.	m	2:31	1 grasshopper.		carried away.
151.	f	2:34	1 moth.		
152.	m	2:35	1 grasshopper.		
153.	f	2:37	1 grasshopper.		
154.	f	2:42	1 grasshopper.		
155.	m	2:43	1 grasshopper.		
156.	f	2:49	1 grasshopper.		
157.	f	2:55	1 fly larva.		
158.	m	3:02	1 grasshopper.	Orange.	carried away.
159.	m	3:22	1 grasshopper.	Blue.	

No.	Sex.	Time.	Food.	Young fed.	Excreta.
160.	f	3:25	1 grasshopper.		carried away.
161.	f	3:37	1 grasshopper.	Blue.	carried away.
162.	m	3:39	1 grasshopper.	Orange.	carried away.
163.	m	3:51	1 larva.	White.	
164.	f	4:09	1 moth.	White.	
165.	m	4:11	1 earthworm.	Green.	
166.	f	4:13	2 mayflies.	Green.	carried away.
167.	m	4:35	1 cutworm.	Green.	carried away.
168.	m	4:45	1 cutworm.	Green.	carried away.
169.	f	4:45	1 dragonfly.	Blue.	
170.	m	4:50	1 spider.	White.	
171.	f	4:54	3 mayflies.	White.	carried away.
172.	m	4:56	1 cutworm.	White.	
173.	f	4:56	1 cutworm.	Orange.	carried away.
174.	f	5:00	3 mayflies.	O. 2, G. 1.	
175.	m	5:02	1 cutworm.	Green.	
176.	f	5:10	3 mayflies.	O. 2, G. 1.	
177.	m	5:15	1 cutworm.	Orange.	
178.	m	5:20	1 cutworm.	Orange.	carried away.
179.	f	5:20	1 unknown.	Green.	
180.	f	5:21	1 white worm.	Green.	from Green.
181.	f	5:23	1 cutworm.	White.	
182.	f	5:35	1 large caterpiller, 1 maybeetle, 2 mayflies.	Green.	
183.	f	5:39	3 mayflies.	W. 2, B. 1.	
184.	m	5:41	1 grasshopper.	Blue.	from Orange.
185.	f	5:44	5 mayflies.	Orange.	
186.	m	5:48	1 cutworm.	Blue.	from Green.
187.	f	5:49	1 mayfly.	Blue.	
188.	f	5:52	1 larva.	Orange.	
189.	m	5:52	2 mayflies.	Blue.	
190.	f	5:55	1 larva.	Green.	
191.	m	6:00	1 cutworm.	Orange.	taken from Orange.
192.	f	6:04	1 cutworm.	Green.	
193.	m	6:11	1 cutworm.	Blue.	
194.	f	6:15	2 mayflies.	Blue.	
195.	f	6:18	3 mayflies, 1 earthworm.	White.	from White.
196.	f	6:28	2 mayflies.	White.	
197.	f	6:35	1 cutworm.	Blue.	
198.	f	6:38	2 mayflies.	Blue.	
199.	m	6:48	1 beetle.	Blue.	
200.	m	6:52	1 mayfly.	White.	from White.
201.	m	6:57	1 mayfly.	White.	
202.	f	6:57	1 beetle, 1 grasshopper.	Orange.	
203.	m	6:59	2 mayflies.	Blue.	from Green.
204.	f	7:02	1 mayfly.	Blue.	
205.	f	7:05	4 mayflies.	White.	
206.	f	7:08	2 mayflies.	W. 1, B. 1.	
207.	f	7:11	1 cutworm.	White.	
208.	f	7:12	1 cutworm.	White.	
209.	f	7:14	2 grasshoppers.	G. 1, B. 1.	
210.	m	7:15	1 cutworm.	White.	from White.
211.	f	7:15	1 earthworm.	Green.	from Green.
212.	m	7:20	1 cutworm.	Orange.	from Orange.

No.	Sex.	Time.	Food.	Young fed.	Excreta.
213.	f	7:23	1 maybeetle.	Green.	from Green.
214.	m	7:26	1 grasshopper.	Green.	
215.	f	7:30	1 dragonfly, 1 mayfly.	Green.	
216.	f	7:36	1 maybeetle.	Blue.	
217.	f	7:38	1 maybeetle.	Blue.	
218.	f	7:42	1 larva.	Blue.	from Green, eaten.
219.	f	7:44	1 spider.	Green.	
220.	f	7:45	1 dragonfly.	Orange.	from Orange
221.	f	7:46	1 moth.	White.	from White.
222.	m	7:50	1 cutworm.	Orange.	
223.	f	7:52	3 mayflies.	White.	
224.	m	7:52	2 worms.	W. 1, B. 1.	
225.	m	7:54	1 cutworm.	White.	
226.	f	7:56	1 mayfly.	White.	
			1 moth.	Blue.	
227.	f	7:56	1 mayfly.	Blue.	
228.	f	8:10	1 mayfly.	Blue.	from Green.
229.	f	8:14	unknown insect.	Green.	
230.	m	8:26	1 maybeetle.	Orange.	from Orange.
231.	m	8:28	1 unknown insect.	Green.	from Green.
232.	m	8:35	1 grasshopper.	Green.	
			Data for June 27, 1911. From 3:30 a. m. to 9:00 p. m.		
233.	—	4:12	1 grasshopper.	——	——
234.	f	4:16	1 cutworm.	——	
235.	f	4:22	3 mayflies.	——	——
236.	f	4:28	3 x * mayflies.	Blue.	from Blue.
237.	m	4:30	1 mayfly.	White.	from White.
238.	f	4:33	3 mayflies.	O. 2, G. 1.	from Orange.
239.	m	4:33	2 mayflies.	Orange.	
240.	f	4:34	2 mayflies, 1 fly.	White.	
241.	m	4:34	1 beetle.	Green.	
242.	f	4:36	1 mayfly, 1 larva.	White.	
243.	m	4:37	2 grasshoppers.	Green.	
244.	f	4:39	1 unknown.	Blue.	
245.	f	4:43	1 worm.	Orange.	
			1 raisin.	Green.	
246.	m	4:44	2 grasshoppers.	Orange.	
247.	f	4:46	3 mayflies.	Orange.	
248.	f	4:54	2 raisins.	Blue.	
249.	f	5:00	3 mayflies.	Orange.	
250.	f	5:21	2 mayflies.	White.	
251.	f	5:30	1 cutworm.	White.	
252.	m	5:35	1 cutworm, 1 mayfly.	Blue.	from Blue.
253.	f	5:38	1 mayfly.	Green.	
			1 moth.	White.	
254.	m	5:40	1 cutworm.	Blue.	
255.	f	5:50	2 moths.	Green.	
256.	f	5:52	1 earthworm.	Green.	——
257.	--	5:55	1 dragonfly, 1 spider.	White.	
258.	f	6:00	1 dragonfly.	Green.	from Green.
259.	f	6:06	2 mayflies.	Green.	

* The letter x is here used in place of the plus mark.

No.	Sex.	Time.	Food.	Young fed.	Excreta.
260.	f	6:08	1 moth.	White.	from White.
			1 earthworm.	Green.	
261.	f	6:11	1 cutworm.	White.	
262.	f	6:13	1 dragonfly.	Orange.	
			1 cutworm.	Green.	
263.	f	6:15	1 moth, 1 grasshopper.	Blue.	
264.	f	6:18	1 unknown bug.	Orange.	from Orange.
265.	f	6:20	1 moth.	Green.	
266.	f	6:28	4 mayflies, 2 moths.	White.	
267.	m	6:29	1 cutworm.	Orange.	
268.	f	6:30	2 raisins.	O. 1, G. 1.	
269.	m	6:31	1 cutworm, 1 moth.	White.	
270.	f	6:31	1 moth.	White.	
271.	f	6:36	1 grasshopper.	White.	
272.	f	6:40	1 mayfly.	Blue.	from Blue.
273.	m	6:41	1 beetle.	White.	
274.	m	6:43	1 beetle.	White.	
275.	f	6:43	2 mayflies.	Green.	
276.	m	6:45	1 butterfly.	Orange.	
277.	f	6:48	2 dragonflies.	White.	
278.	f	6:49	1 maybeetle.	White.	
279.	f	6:53	1 grasshopper.	Green.	from Green.
			1 flying ant.	Blue.	
280.	f	6:55	1 cutworm.	White.	
281.	f	6:58	1 grasshopper, 1 spider.	Blue.	
282.	m	7:07	1 moth.	White.	
283.	f	7:16	1 unknown.	White.	
284.	m	7:16	1 cutworm.	White.	
285.	f	7:20	1 moth.	Blue.	
286.	m	7:35	1 cutworm.	White.	
287.	f	7:35	1 mayfly.	Blue.	
288.	f	7:38	2 moths.	G. 1, O. 1.	
289.	m	7:40	1 moth.	Orange. from Orange eaten.	
290.	f	7:41	2 unknown insects.	Green.	
291.	m	7:42	1 cutworm.	Green.	
292.	f	7:44	unknown.	Blue.	from Blue.
293.	m	7:48	1 grasshopper.	Green.	from Green.
294.	f	7:50	1 moth.	White.	
			2 mayflies.	Blue.	
295.	m	7:56	1 cutworm.	White.	from White.
296.	f	8:03	1 dragonfly.	Blue.	
297.	f	8:06	1 grasshopper.	Orange.	
			1 dragonfly.	Green.	
298.	m	8:08	1 moth, 1 grasshopper.	White.	
299.	f	8:12	2 moths.	Blue.	
300.	f	8:14	1 grasshopper.	Blue.	
301.	f	8:15	1 grasshopper, 1 moth.	Blue.	
302.	m	8:16	1 ant, 1 worm.	Orange.	
303.	f	8:21	2 moths.	Green.	
304.	f	8:24	1 moth.	Blue.	
305.	f	8:26	3 moths.	O, 2. G. 1.	
306.	f	8:27	2 moths.	B. 1, G. 1.	
307.	m	8:34	1 cutworm.	Green.	from Blue
308.	f	8:35	1 mayfly, 1 moth.	Blue.	

No.	Sex.	Time.	Food.	Young fed.	Excreta.
309.	m	8:35	2 mayflies.	W. 1, G. 1.	
310.	f	8:40	1 mayfly, 1 moth.	Blue.	
			1 unknown insect.	Orange.	
311.	m	8:44	2 moths.	G. 1, W. 1.	from White.
312.	f	8:46	1 mayfly.	Orange.	
			1 dragonfly.	Green.	
313.	f	8:48	2 moths.	O. 1, G. 1.	
134.	m	8:51	1 cutworm.	Blue.	
			1 moth.	White.	
315.	f	8:54	1 grasshopper.	Orange.	
316.	f	8:58	2 moths.	White.	
317.	f	9:09	1 mayfly,1 damsel fly.	White.	from White.
318.	m	9:10	unknown.	Orange.	
319.	f	9:12	1 moth.	Blue.	
320.	f	9:15	1 mayfly, 2 moths.	Blue.	
321.	m	9:16	2 cutworms.	Orange.	
322.	f	9:16	1 wire worm, 1 moth.	White.	
323.	f	9:17	1 caterpiller.	Orange.	
324.	m	9:23	1 grasshopper, 1 mayfly.	Blue.	
325.	f	9:27	1 unknown insect.	Green.	
326.	m	9:29	1 moth, 1 worm.	Green.	
327.	f	9:30	1 raisin.	Blue.	
328.	m	9:32	2 cutworms.	Orange.	
329.	f	9:32	3 x * moths.	Green.	
330.	f	9:34	1 wire worm, 2 moths.	White.	
331.	m	9:35	1 grasshopper.	Blue.	
			1 moth.	White.	
332.	m	9:37	1 cutworm.	White.	from White eaten.
333.	f	9:38	2 mayflies.	Green.	
334.	f	9:39	4 x * mayflies.	Green.	
335.	f	9:40	1 cut worm.	White.	
336.	f	9:45	1 beetle.	Orange.	
337.	m	9:49	1 dragonfly, 1 moth.	Orange.	
338.	f	9:50	3 x * moths.	Green.	
339.	f	9:54	1 moth.	Blue.	
340.	f	9:57	1 moth.	Green.	
341.	f	10:01	1 moth, 1 beetle.	Green.	from Green eaten.
342.	f	10:03	1 moth, 3 mayflies.	White.	
343.	m	10:15	1 wire worm, 1 moth, 1 cutworm.	Green.	
344.	f	10:16	5 x * mayflies.	B. 3, G. 2.	
345.	m	10:16	1 wire worm.	White.	
346.	m	10:18	1 cutworm.	Orange.	from Orange.
347.	f	10:21	2 moths.	Green.	
348.	f	10:24	unknown.	White.	from White eaten.
349.	m	10:26	1 moth.	White.	
350.	f	10:30	2 moths.	Green.	
351.	m	10:30	1 moth.	Orange.	
352.	f	10:31	1 raisin.	Orange.	from Orange.
353.	m	10:33	1 moth, 1 beetle.	Green.	
354.	f	10:35	1 beetle.	White.	
355.	f	10:39	1 moth.	Green.	

* The letter x is here used in place of the plus mark.

No.	Sex.	Time.	Food.	Young fed.	Excreta.
356.	m	10:42	1 grasshopper.	Orange.	
357.	f	10:43	1 grasshopper.	Green.	
			1 mayfly.	White.	
358.	m	10:45	1 moth.	White.	
359.	f	10:50	3 moths.	Green.	
360.	f	10:53	3 moths.	G. 1, W. 1, O. 1.	
361.	f	10:56	1 grasshopper.	Blue.	
362.	f	11:00	2 grasshoppers.	White.	from White.
363.	m	11:03	1 cutworm.	Orange.	
364.	f	11:05	3 moths.	Green.	from Green.
365.	f	11:13	1 mayfly.	White.	
366.	f	11:17	1 cutworm.	Green.	
367.	m	11:17	1 cutworm.	Orange.	
368.	f	11:20	1 grasshopper.	Green.	
369.	m	11:22	1 grasshopper.	Green.	
370.	f	11:23	1 moth.	Orange.	
371.	m	11:25	2 grasshoppers.	Green.	
372.	m	11:35	1 grasshopper.	Green.	
373.	f	11:36	3 moths.	G. 2, B. 1.	
374.	m	11:37	1 moth.	White.	
375.	f	11:38	1 cutworm.	White.	
376.	f	11:48	1 mayfly.	Orange.	
377.	m	11:49	1 mayfly.	Orange.	from Orange.
378.	f	11:50	1 moth.	Green.	
379.	m	11:55	1 grasshopper.	Green.	from Green.
380.	f	11:56	2 grasshoppers, 1 moth.	Blue.	
381.	f	12:06	1 cutworm, 1 moth.	White.	from White.
382.	m	12:07	1 cutworm, 1 moth.	White.	
383.	f	12:12	1 mayfly.	Green.	
384.	m	12:17	2 moths.	Orange.	
385.	f	12:20	1 mayfly, 1 moth.	Green.	
386.	f	12:25	2 grasshoppers.	Green.	
387.	m	12:26	1 larva.	Green.	
388.	f	12:27	1 cutworm.	Orange.	
389.	m	12:28	2 green worms.	Blue.	
390.	f	12:32	1 grasshopper.	White.	
391.	f	12:33	1 grasshopper.	White.	
392.	m	12:36	2 moths.	Blue.	
393.	f	12:43	1 mayfly.	Orange.	
394.	m	12:46	1 cricket.	Blue.	
395.	f	12:51	1 grasshopper.	Orange.	
396.	f	1:06	2 moths.	Orange.	
397.	m	1:06	1 cutworm.	Orange.	
398.	f	1:07	1 raisin.	White.	
399.	m	1:08	1 grasshopper.	Green.	
400.	f	1:09	1 moth.	White.	
401.	m	1:17	1 maybeetle.	Orange.	
402.	f	1:20	1 grasshopper.	Blue.	
403.	f	1:22	3 moths.	O. 2, 1 escaped.	
404.	m	1:22	2 moths.	Orange.	
405.	f	1:26	1 beetle, 3 x black ants.	Orange.	
406.	m	1:34	1 grasshopper.	Green.	from Green.
407.	f	1:34	2 mayflies.	Orange.	
408.	f	1:50	1 cutworm.	Orange.	from Orange.

No.	Sex.	Time.	Food.	Young fed.	Excreta.
409.	f	1:52	2 moths.	Blue.	from Blue.
410.	f	1:54	1 moth, 1 dragonfly.	White.	from White.
411.	m	1:55	1 grasshopper.	Blue.	
412.	m	1:58	1 cutworm.	Orange.	
413.	f	1:59	1 moth.	Green.	
414.	f	2:00	1 grasshopper.	Green.	
415.	m	2:07	1 grasshopper.	White.	
416.	f	2:14	1 mayfly.	Orange.	
417.	f	2:16	3 grasshoppers.	B. 1, G. 2.	from Green.
418.	f	2:17	1 grasshopper.	Blue.	
419.	f	2:21	1 moth.	White.	
420.	f	2:22	2 unknown bugs.	White.	
421.	f	2:24	1 grasshopper.	Green.	
422.	f	2:26	1 grasshopper.	White.	
423.	f	2:28	1 grasshopper.	Orange.	from Orange.
424.	f	2:30	1 moth.	White.	
425.	m	2:31	1 grasshopper.	Orange.	
426.	f	2:32	unknown.	White.	
427.	f	2:35	1 moth, 1 earthworm.	Green.	
			1 ant.	Blue.	
428.	m	2:36	1 grasshopper.	Green.	
429.	m	2:44	1 cutworm.	Blue.	
430.	f	2:46	2 unknown insects.	White.	
431.	m	2:46	1 grasshopper.	Blue.	
432.	m	2:50	1 grasshopper.	Orange.	
433.	f	2:52	2 grasshoppers.	White.	
434.	f	3:00	1 grasshopper.	White.	
435.	f	3:03	1 moth.	Blue.	
436.	m	3:08	2 grasshoppers.	Orange.	from Orange eaten.
437.	f	3:09	2 x black ants.	Green.	
438.	f	3:10	1 grasshopper.	Orange.	
439.	f	3:11	1 moth.	Blue.	from Blue.
440.	f	3:16	1 moth.	Green.	
441.	m	3:20	1 moth.	White.	
442.	f	3:22	1 moth.	White.	from White.
443.	m	3:31	1 moth.	White.	
444.	f	3:32	1 grasshopper.	Blue.	
445.	m	3:36	1 grasshopper.	White.	
446.	f	3:39	1 grasshopper.	White.	
447.	f	3:41	1 grasshopper.	White.	
448.	m	3:41	1 ant.	Orange.	
449.	f	3:44	1 beetle.	Blue.	
450.	f	3:46	1 grasshopper.	Orange.	
451.	m	3:48	1 grasshopper.	Orange.	from Orange.
452.	m	3:51	1 moth.	Orange.	
			1 unknown.	Green.	
453.	m	3:52	1 grasshopper.	Orange.	
454.	f	3:57	1 grasshopper.	White.	
455.	f	3:59	1 grasshopper.	Orange.	
456.	f	4:04	1 moth.	Blue.	
457.	m	4:06	1 grasshopper.	Orange.	
458.	f	4:06	1 moth.	Green.	
459.	f	4:14	1 grasshopper.	White.	removed.
460.	m	4:17	1 moth.	Blue.	

No.	Sex.	Time.	Food.	Young fed.	Excreta.
461.	m	4:20	1 ant x.	Green.	removed.
462.	m	4:24	1 unknown.	Green.	
463.	f	4:24	1 moth.	Orange.	removed.
464.	m	4:30	1 moth.	Blue.	
465.	f	4:35	1 raisin.	Orange.	
466.	f	4:40	1 grasshopper.	White.	removed.
467.	m	4:44	1 moth.	Blue.	
468.	f	4:49	1 grasshopper.	Green.	
469.	m	4:52	1 cutworm.	Blue.	removed
470.	m	4:55	1 cutworm.	White.	
471.	m	5:06	1 unknown insect.	Green.	
472.	f	5:19	1 worm.	Green.	
473.	f	5:26	1 moth.	Blue.	
			1 cutworm.	White.	
474.	m	5:27	1 unknown.	Green.	
475.	m	5:30	1 unknown.	Orange.	
476.	m	5:32	1 cutworm.	White.	
477.	f	5:33	1 cutworm.	Orange.	
478.	f	5:35	1 cutworm.	Orange.	removed.
479.	f	5:40	1 dragonfly.	White.	removed.
480.	f	5:43	2 moths.	B. 1, G. 1.	removed.
481.	m	5:45	1 grasshopper.	Blue.	
482.	f	5:46	1 grasshopper.	White.	from White.
483.	f	5:49	1 grasshopper.	Blue.	
484.	m	5:54	1 worm.	Green.	
485.	f	6:05	1 mayfly, 1 cricket.	Green.	from Green.
486.	f	6:11	1 maybeetle.	Blue.	from Blue.
487.	f	6:15	1 mayfly, 2 moths.	Green.	
488.	m	6:17	1 cutworm.	Blue.	
489.	f	6:21	1 grasshopper, 2 dragonflies.	Green.	
490.	f	6:26	1 wireworm.	White.	
491.	m	6:28	2 cutworms, 1 unknown.	White.	from White.
492.	f	6:30	3 mayflies.	White.	
493.	m	6:43	1 moth, 1 grasshopper.	White.	
494.	f	6:44	1 cutworm.	White.	from Blue.
495.	f	6:45	1 grasshopper.	White.	
496.	m	6:47	1 cutworm.	Blue.	
497.	f	6:47	2 mayflies.	Green.	
498.	f	6:52	1 larva.	Blue.	from Blue.
499.	f	6:57	1 larva.	White.	from White.
500.	m	6:58	1 grasshopper.	Blue.	from Blue.
501.	f	7:05	1 larva.	White.	
502.	m	7:10	1 larva.	Orange.	
503.	f	7:24	1 cutworm.	White.	
504.	f	7:26	1 grasshopper.	White.	
505.	f	7:28	2 cutworms.	W. 1, B. 1.	from White.
506.	f	7:31	1 grasshopper.	White.	
507.	f	7:48	2 moths.	Orange.	
508.	f	7:49	1 raisin.	Orange.	
509.	f	7:52	unknown.	Orange.	
510.	m	7:56	1 worm.	White.	from White.
511.	f	7:56	3 x moths.	Blue.	from Blue.
512.	f	7:58	1 moth.	Green.	
513.	m	7:59	1 moth.	Orange.	

No.	Sex.	Time.	Food.	Young fed.	Excreta.
514.	f	8:00	1 mayfly.	Green.	
515.	f	8:03	2 moths.	Blue.	
516.	f	8:06	3 moths.	B. 2, G. 1.	
517.	f	8:09	2 moths.	Green.	
518.	f	8:10	2 moths.	Green. from Green & White.	
			Data for June 28, 1911. From 3:30 a. m. to 9:00 p. m.		
519.	m	4:02	unknown.	——	removed.
520.	m	4:07	1 moth.	——	removed.
521.	f	4:14	1 moth.	Orange.	
522.	f	4:15	1 moth.	White.	
523.	m	4:15	3 moths.	Orange.	
524.	m	4:16	2 unknowns.	G. 1, O. 1.	
525.	f	4:16	1 grasshopper.	White.	
526.	f	4:17	1 moth.	Blue.	
527.	m	4:17	1 unknown.	White.	
528.	f	4:18	2 x moths.	Orange.	
529.	f	4:19	1 grasshopper.	Green.	
530.	m	4:20	1 unknown.	Orange.	removed.
531.	f	4:21	2 unknowns.	G. 1, B. 1.	
532.	f	4:22	1 mayfly.	Blue.	
533.	m	4:24	1 moth, 1 larva.	Orange.	
534.	m	4:28	3 x unknowns.	O. B. W.	
535.	f	4:29	2 x unknowns.	White.	removed.
536.	f	4:31	2 grasshoppers.	Orange.	
537.	m	4:38	1 larva.	Orange.	
538.	f	4:10	1 grasshopper.	White.	
			2 mayflies.	Blue.	
539.	f	4:50	2 unknowns.	Orange. Blue.	
540.	m	4:55	1 beetle.	Orange.	
541.	f	4:58	1 moth.	White.	
542.	f	5:05	1 mayfly.	Green.	
543.	f	5:10	1 grasshopper.	Blue.	
544	f	5:11	1 mayfly, 1 cricket.	Green.	removed.
545.	f	5:12	1 grasshopper.	White.	removed.
546.	f	5:15	4 mayflies.	O. 3, W. 1.	
547.	f	5:25	1 mayfly.	Orange.	
548.	f	5:28	1 grasshopper.	White.	
549.	f	5:30	1 unknown.	Orange.	
550.	f	5:32	1 grasshopper.	Orange.	
551.	f	5:35	1 grasshopper.	White.	
552.	f	5:36	1 mayfly.	Green.	
553.	m	5:40	1 cutworm.	White.	
554.	f	5:42	1 grasshopper.	Green.	
555.	f	5:45	5 mayflies.	O. 2, W. 3.	removed.
556.	f	5:48	2 mayflies.	Green.	removed.
557.	f	5:50	1 mayfly.	Blue.	
558.	f	5:53	1 grasshopper.	Green.	
559.	m	5:58	3 mayflies.	White.	
560.	m	6:00	2 beetles.	Green.	
561.	f	6:02	1 mayfly.	Blue.	
562.	m	6:02	2 beetles.	Blue.	
563.	f	6:03	1 moth.	Blue.	
564.	f	6:04	1 unknown.	Green.	

No.	Sex.	Time.	Food.	Young fed.	Excreta.
565.	m	6:07	1 cutworm.	White.	
566.	f	6:07	1 cutworm.	Green.	
567.	f	6:12	1 grasshopper.	Orange.	removed.
568.	m	6:12	1 grasshopper.	Orange.	
569.	m	6:14	1 mayfly, 1 worm.	Blue.	
570.	f	6:15	2 mayflies.	Blue.	
571.	m	6:16	4 mayflies.	Blue.	removed.
572.	f	6:20	5 mayflies.	Orange.	
573.	m	6:25	4 mayflies.	White.	
574.	f	6:25	2 mayflies, 1 cutworm.	Blue.	
575.	f	6:27	1 mayfly, 2 moths.	Orange.	
576.	f	6:35	7 mayflies.	Blue.	
			1 beetle.	Green.	
577.	f	6:44	6 x mayflies.	White.	
578.	m	6:44	6 x mayflies.	Orange.	
579.	m	6:53	5 mayflies.	Orange.	from Orange.
580.	m	6:54	1 larva.	White.	from White.
581.	f	6:57	2 mayflies.	Blue.	
582.	m	7:06	1 unknown.	Blue.	
583.	m	7:12	4 x mayflies.	Green.	from Green.
584.	f	7:12	4 x mayflies.	Green.	
585.	m	7:13	1 unknown.	Orange.	
586.	f	7:14	1 mayfly.	Green.	
587.	m	7:15	3 x mayflies.	White.	
588.	f	7:17	4 x mayflies.	O. G.	
589.	m	7:18	2 x mayflies.	Green.	
590.	f	7:20	1 mayfly, 1 raisin.	Orange.	
591.	f	7:21	3 x mayflies.	Green.	
592.	m	7:22	3 mayflies.	Green.	
593.	f	7:26	1 mayfly, 1 unknown.	———	
594.	f	7:28	3 x mayflies.	White.	
595.	m	7:31	3 mayflies.	Blue.	
596.	f	7:31	1 unknown.	———	
597.	f	7:33	3 x mayflies.	O. G.	
598.	f	7:35	2 mayflies.	Green.	
			1 unknown.	White.	from White.
599.	m	7:37	3 mayflies.	Green.	
600.	f	7:38	3 mayflies.	Green.	
601.	f	7:41	6 x mayflies.	White.	
602.	m	7:44	1 damselfly, 1 mayfly.	White.	
603.	f	7:53	4 x mayflies.	O. 2, B. Rest.	from Blue.
604.	f	7:56	1 mayfly.	Orange.	
605.	m	7:55	2 mayflies.	Blue.	from Blue.
606.	m	7:59	2 mayflies.	Green.	
607.	f	8:01	1 cutworm, 1 mayfly.	White.	
608.	f	8:08	2 mayflies.	Orange.	
609.	f	8:11	1 cutworm.	Orange.	
610.	f	8:15	5 mayflies.	B. 2, W. 3.	
611.	f	8:17	4 mayflies.	White.	
612.	m	8:20	4 mayflies.	Blue.	
613.	f	8:20	2 mayflies.	White.	
614.	m	8:23	4 mayflies.	W. 2 mayflies.	
			1 cutworm.	B. rest.	
615.	m	8:26	1 moth, 1 mayfly, 1 cutworm.	Orange.	

No.	Sex.	Time.	Food.	Young fed.	Excreta.
616.	f	8:28	1 maybeetle.	White.	from White.
617.	f	8:30	4 mayflies.	White.	
618.	f	8:31	1 cutworm.	Orange.	
619.	f	8:33	6 x mayflies.	White.	
620.	m	8:35	1 cutworm, 1 mayfly.	Blue.	
621.	f	8:35	1 cutworm.	Blue.	
622.	m	8:40	1 cutworm.	Green.	
623.	m	8:43	1 cutworm, 1 wireworm.	Green.	
624.	f	8:47	1 worm.	Green.	
			1 mayfly.	Orange.	
625.	f	8:49	2 mayflies.	B. 1, G. 1.	
626.	f	8:53	1 mayfly.	White.	from Green.
627.	f	8:58	2 mayflies.	White.	
628.	m	8:59	1 wireworm.	Green.	from Green.
629.	f	9:04	1 mayfly.	Blue.	
630.	m	9:05	1 mayfly.	White.	
			1 wireworm.	Green.	
631.	f	9:09	2 mayflies.	Green.	
632.	f	9:13	1 mayfly, 1 wireworm.	Green.	
633.	f	9:15	1 mayfly.	Blue.	
634.	f	9:17	2 grasshoppers.	Green.	
635.	m	9:17	unknown.	Orange.	
636.	m	9:19	3 mayflies.	B. 1, W. 2.	
637.	f	9:23	1 mayfly, 1 wireworm, 1 fly.	Blue.	
638.	m	9:32	1 wireworm.	Orange.	
639.	f	9:33	unknown.	Orange.	
640.	f	9:35	1 raisin.	Blue.	
641.	m	9:36	unknown.	W. O. fed.	from White.
642.	f	9:39	3 mayflies.	Orange.	
643.	f	9:40	1 mayfly, 1 damselfly.	Orange.	
644.	m	9:48	3 mayflies.	Green.	from Green.
645.	f	9:52	1 mayfly, 1 raisin.	Green.	
646.	m	9:56	1 grasshopper.	Orange.	
647.	f	10:01	1 mayfly.	White.	
648.	m	10:03	1 spider.	Orange.	
649.	m	10:06	2 mayflies.	Orange.	
650.	f	10:09	2 moths.	White.	from White.
651.	f	10:11	1 grasshopper.	Blue.	from Blue.
652.	m	10:12	4 mayflies.	Green.	
653.	f	10:14	1 grasshopper.		
654.	m	10:22	2 moths.	O. 1, G. 1.	
655.	f	10:24	2 larvae.	O. 1, G. 1.	
656.	f	10:27	1 raisin.		removed.
657.	m	10:29	1 larva.	White.	
658.	m	10:30	1 larva.	Orange.	
659.	f	10:30	1 unknown.	Blue.	
660.	f	10:33	2 ants.	W. B.	
661.	f	10:36	1 grasshopper.	Blue.	
662.	m	10:37	1 moth.	Blue.	
			1 mayfly.	Orange.	
663.	f	10:38	1 mayfly.	White.	
664.	m	10:40	1 larva.	Green.	
665.	m	10:47	2 mayflies.	Orange.	
666.	f	10:50	1 mayfly.	White.	

No.	Sex.	Time.	Food.	Young fed.	Excreta.
667.	f	10:50	1 moth.		
668.	m	10:54	2 mayflies.	Blue.	
669.	f	10:54	1 grasshopper.	Green.	
			1 moth.	Blue.	
670.	f	10:58	1 butterfly, 1 mayfly.	White.	from White.
671.	f	11:06	1 moth, 1 cutworm.	Blue.	
672.	m	11:07	1 cutworm.	White.	
673.	f	11:09	1 moth.	Blue.	
674.	f	11:14	2 moths.	Orange.	
675.	f	11:15	3 mayflies.	Green.	
676.	m	11:15	1 grasshopper.	White.	
677.	f	11:16	1 grasshopper.	Orange.	
678.	f	11:20	4 mayflies.	Green.	
679.	f	11:26	2 mayflies.	Blue.	
680.	m	11:26	1 mayfly.	Green.	
681.	f	11:30	2 mayflies.	Blue.	
682.	f	11:36	2 mayflies.	Blue.	
683.	m	11:40	1 cutworm.		
684.	m	11:45	1 grasshopper.	White.	
685.	f	11:45	3 moths.	White.	from White.
686.	f	11:50	1 grasshopper.	White.	
687.	f	11:51	1 grasshopper.	Green.	from Green.
688.	f	11:56	2 moths.	Blue.	
689.	f	12:05	1 moth.	Blue.	
690.	m	12:06	1 grasshopper.	Orange.	from Orange.
691.	f	12:08	1 mayfly.	Orange.	
692.	m	12:09	1 moth.	Blue.	
693.	f	12:10	2 mayflies.	White.	
694.	f	12:13	2 mayflies.	White.	
695.	f	12:14	1 mayfly.	White.	
696.	m	12:14	1 grasshopper, 1 mayfly.	White.	
697.	f	12:16	1 mayfly.	Orange.	
698.	f	12:19	4 grasshoppers.	G. 3, W. 1.	
699.	m	12:26	2 mayflies.	Orange.	
700.	m	12:37	1 caterpiller.	White.	
701.	m	1:08	2 mayflies.	Orange.	
			1 moth.	White.	
702.	m	1:10	1 piece of cherry.	Orange.	
703.	m	1:14	1 moth.	Orange.	
704.	m	1:15	1 moth.	Blue.	
705.	m	1:16	1 moth.	Blue.	
706.	m	1:25	3 mayflies.	O. 2, B. 1.	
707.	m	1:32	1 grasshopper.	Blue.	
708.	m	1:41	1 grasshopper, 1 larva.	Orange.	
709.	m	1:47	1 grasshopper, 1 mayfly.	Blue.	from Blue.
710.	m	1:49	1 grasshopper.	White.	
711.	m	1:52	1 grasshopper.	White.	
712.	m	1:53	1 grasshopper.	Orange.	
713.	m	1:57	1 grasshopper.	Blue.	
714.	m	2:06	1 grasshopper.	Orange.	
715.	m	2:08	1 grasshopper.	Orange.	from Orange.
			1 mayfly.	White.	
716.	m	2:15	2 grasshoppers.	Orange.	
717.	m	2:19	1 grasshopper.	Orange.	

718.	m	2:23	1 grasshopper.	Orange.	
719.	m	2:25	1 grasshopper.	Orange.	
720.	m	2:26	1 mayfly.	White.	from White.
721.	m	2:40	2 grasshoppers.	O. 1, B. 1.	from Blue.
722.	f	2:53	2 x ants.	White.	
723.	f	2:54	1 ant.	White.	
724.	f	3:00	3 x ants.	Blue.	
725.	f	3:33	1 grasshopper, 1 mayfly.	Blue.	
726.	f	3:45	1 cutworm.	Blue.	
727.	f	3:50	1 grasshopper.	Blue.	
728.	f	3:52	1 mayfly.	White.	from White.
729.	f	3:58	3 moths.	White.	
730.	f	4:00	2 mayflies.	White.	
731.	f	4:01	1 grasshopper.	White.	
732.	f	4:04	1 grasshopper, 1 larva.	Blue.	from Blue.
733.	f	4:06	unknown.	White.	
734.	f	4:55	1 dragonfly.	Blue.	
735.	m	5:43	1 mayfly.	Blue.	
			2 moths.	White.	from White.
736.	f	5:45	unknown.	Blue.	
737.	f	5:53	1 grasshopper, 1 moth.	Blue.	
738.	f	5:55	1 mayfly.	Blue.	
739.	f	5:58	1 grasshopper.	Blue.	
740.	f	6:00	1 mayfly.	Blue.	
741.	f	6:01	1 mayfly.	Blue.	
742.	f	6:04	1 mayfly.	White.	
			1 moth.	Blue.	
743.	f	6:06	3 mayflies.	B. 2, W. 1.	
744.	f	6:07	1 beetle, 1 mayfly.	White.	
745.	f	6:42	1 moth.	Blue.	
746.	f	7:02	1 cutworm.	Blue.	
747.	f	7:04	1 moth.	Blue.	
748.	f	7:08	1 mayfly, 1 moth.	White.	
749.	f	7:18	1 moth.	Blue.	from Blue.
750.	m	8:25	1 grasshopper.	Blue	

Data for June 29, 1911. From 4:00 a. m. to 8:10 a. m.

751.	m	4:18	1 grasshopper.	Blue	
752.	f	4:20	unknown.	Blue.	
753.	f	4:25	1 mayfly.	White.	from White.
754.	f	4:30	1 earthworm.	Blue.	from White.
755.	f	4:31	unknown.	White.	from Blue.
756.	f	4:33	3 mayflies.	Blue.	
757.	f	4:36	1 raisin.	White.	
758.	m	4:40	1 moth.	White.	
759.	f	4:56	unknown.	White.	
760.	f	5:00	2 moths.	White.	
761.	f	5:10	3 mayflies.	White.	
762.	f	5:42	1 mayfly.	White.	
763.	f	6:13	3 mayflies.	White.	
764.	f	6:15	1 mayfly.	White.	
765.	f	6:16	1 beetle.	White.	
766.	f	6:21	1 beetle.	White.	
767.	f	6:30	1 mayfly.	White.	
768.	f	6:33	1 moth.	White.	

No.	Sex.	Time.	Food.	Young fed.	Excreta.
769.	f	6:45	unknown.	White.	
770.	f	6:53	1 grasshopper.	White.	
771.	f	7:02	1 grasshopper.	Blue.	Blue on nest.
772.	f	7:07	1 beetle.	White.	
773.	m	7:14	1 grasshopper.	White.	
774.	f	7:22	unknown.	White.	
775.	m	7:35	1 moth.	Blue.	

Brooding.

The first observations were taken on the afternoon of June 23, when the young birds were about six days old. The afternoon was hot and sultry and the nest was in such a position as to be exposed to the hot rays of the sun. One or the other of the old birds brooded almost all of the time. During the afternoon, the male brooded once for a period of twenty-six minutes and the female for twenty minutes, but the periods as a rule were short, being from two to five minutes in length. At about two o'clock the shadow of an oak tree was thrown on the nest and the old birds ceased brooding. On the next day the brooding was carried on until about the same time, but the old birds were not so particular about staying on the nest all of the time, and by the following Monday, June 26, the brooding to protect the young had practically ceased.

There was a marked difference in the position assumed by the male and female in brooding. The male sat on the edge of the nest with his feathers ruffled up, or stood in the nest in much the same posture, affording very poor protection for the young as compared with that given by the female. She spread her wings, ruffled her feathers, and stood in such a position as to completely shade the nest. Figures 3 and 4 show this contrast in behavior much better than it can be described. The position in protecting the young from the rain during the storm of the 25th, was entirely different. The female was on the nest every time it was visited during the morning. She sat down close to the nest and so well did she cover it that, after one of the worst rain storms of the season, the nest was perfectly dry. On the last two nights that we watched the nest until the close of the feeding activity, we

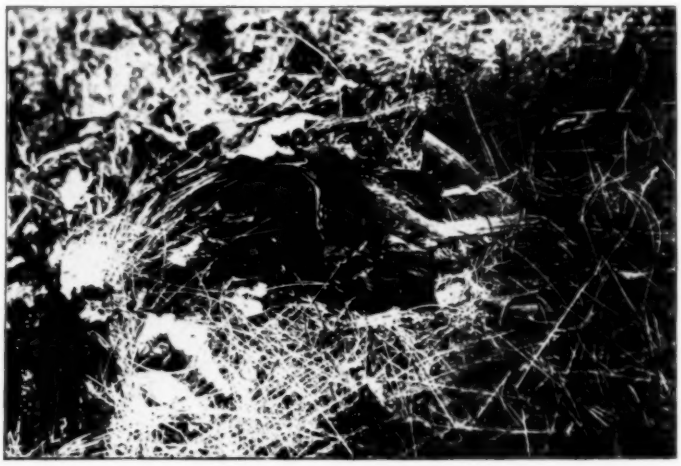

Figure 3. The female brooding. Notice the position of the wings and the open mouth. The white spot is visible also in this figure.

found, to our surprise, that it was the male who commenced brooding for the night; but whether the female took his place part of the time was not determined. Neither were we able to determine which bird left the nest as we approached in the morning.

From this somewhat meager data on brooding, it would seem that at the age of six days, at least, the old birds brooded only during the heat of the day. Brooding as a protection from the heat practically ceased on the seventh and eighth day. Brooding at night and as a protection from the rain continued until the young left the nest.

Feeding the Young.

The principal object of these observations was to obtain data in regard to the character and amount of food the young received from the parents, and in this we were fairly successful. Besides this, much other data was secured relative to the manner of feeding. Table II will show the number of times each day that the parent birds brought food to the young during the time they were under observation.

TABLE II.

Showing the number of visits by each parent bird.

Date.	Time.	By Male.	By Female.	Total.
June 23—	12:45 P. M.–6:00 P. M.	26	32	58
June 24—	12:50 P. M.–5:55 P. M.	27	41	68
June 26—	12:55 P. M.–8:40 P. M.	47	59	106
June 27—	3:30 A. M.–9:00 P. M.	98	186	286 *
June 28—	3:30 A. M.–8:42 P. M.	90	142	232
June 29—	4:15 A. M.–8:10 A. M.	4	21	25
Total times fed		292	481	775

From this table it will be seen that the female was much more active than the male in procuring food. The data given

* Twice on the 27th the young were fed without the sex of the parent feeding being determined.

for June 29, and a small part of that for June 28, does not correctly represent the total feeding activity of both parents, for, after the first fledgling left the nest, one of the parents would remain with it for a period of two hours or more until relieved by its mate — that is, the labor of feeding was divided between the nest and the departed brood. They could be seen in a ravine near by attending to the fledglings, but the distance was too great to secure any trustworthy data. From June 26 at 12:55 p. m. until the last young bird left the nest, practically every feeding is recorded. The two mornings when the observations commenced at 3:30 a. m. it was found that the old birds did not begin feeding till about 4:15, and on the morning of the 29th the parent bird was still on the nest when the observer entered the blind at 4:15. So from noon on the 26th until they left the nest three days after, the nestlings were under constant observation during the time of daily feeding activity.

Table III will show something of the character of the food received by the young birds during this part of the nestling period and also something of the quantity. It will be noticed that in the tabulated data given that the number of insects was not always determined exactly but was entered in this manner, "6+mayflies," etc. In all such cases the minimum number was used in computing the tables. As all of the persons who assisted were cautioned especially to note the number of insects exactly, it is safe to assume that if there be any error in the data, it is in having recorded too few insects rather than too many.

TABLE III.

Date—June	23	24	26	27	28	29	Totls.
Unknown Insects	6	.	3	21	21	5	56.
Larvæ	2	.	4	6	10	.	22.
Spiders	2	2	2	2	1	.	9.
Raisins, Cherry	.	.	.	10	5	1	16.
Unknown Worms	.	3	3	6	2	.	14.
Earthworms	.	1	3	3	.	1	8.

TABLE III—(Continued).

Date—June	23	24	26	27	28	29	Totls.
Wireworms	.	.	.	5	6	.	11.
Ants	.	.	.	10	7	.	17.
Caterpillars	.	.	1	1	1	.	3.
Flies	1	1	2	1	1	.	6.
Damselflies	.	.	.	1	2	.	3.
Dragonflies	1	.	3	13	1	.	18.
Butterflies	1	.	1	1	1	.	4.
Crickets	3	.	.	2	1	.	6.
Green Worms	8	5	.	2	.	.	15.
Cutworms	12	5	20	48	18	.	103.
Centipedes	2	.	.	.	.	.	2.
Moths	28	13	4	139	48	5	237.
Mayflies	6	27	56	79	244	13	425.
Beetles	3	6	6	12	8	3	38.
Grasshoppers	31	41	35	81	55	4	247.
Daily Totals	106	104	143	443	432	32	1260.

This table, which covers only a period of fifty-six and a fraction hours, shows a total of twelve hundred and forty-four insects (excepting a few worms) consumed by this one family of young birds in that time. This does not, of course, include anything eaten by the parents. As it was found that the working day for the parents began at 4:15 a. m. and closed about 8:30 p. m., a period of about sixteen hours, it will be seen that the period of fifty-six hours, during which the nest was under observation, was only a fraction of the total number of feeding hours. The young birds were in the nest from June 17 to June 29, a period of twelve days; but as they left on the morning of the 29th, we will omit that day from the total, leaving a period of eleven days for the nestling period. These eleven days represent one hundred and seventy-six feeding hours — over three times the period during which the birds were under observation. Computing the total number of insects eaten by the nestlings on the basis of the food consumed during the fifty-six hours, we have a total of 3800. While this number seems large, it must be borne in mind that the possible lower food requirement of the first half of the

nestling period is compensated in the calculation by those insects missed in the data for the last half. The fledglings were observed around the ravine as late as July 25 to be positively identified. As it is certain that the daily consumption of insects did not diminish to any marked extent, the value of these birds as insect destroyers may readily be inferred. The four insects consumed in the largest quantities were found to be as follows: grasshoppers 247, Mayflies 425, moths 237, and cutworms 103. Two of these, at least, are positively destructive insects; and in the summer of 1911 the grasshoppers were almost a plague in parts of northern Iowa. Many fields of grain were destroyed and many more were cut green to prevent destruction, making the oats light weight and of poor quality. The grasshoppers stripped the oats from the straw by cutting the stem of each grain. This was done while the grain was in the milk, so it was a total loss. Many fields which promised from thirty to forty bushels yielded from five to ten bushels to the acre after the grasshopper invasion. As twenty per cent of the food of this family of thrasher consisted of grasshoppers, it can readily be seen this species is of considerable economic importance. A glance at the rest of the list will show that almost without exception, the insects fed to the young were of an injurious character. The feeding of the raisins was for a time a puzzle to all, and at first they were not recognized as raisins; but after being brought several times they were identified. The next question was as to the source of supply. It was observed that only the female brought them. A careful watch was kept around the buildings and she was seen to pick something out of the grass by the kitchen door. On investigation a quantity of raisins was found there and it was learned that a box of them had been accidentally spilled a few days before. The male was not observed to bring any, and as an experiment, a few were placed near the nest. He paid no attention to them for a number of visits, but finally he picked at one several times; then picked it up, carried it to the fence and swallowed it. He made no attempt to feed them to the young, although sev-

Figure 4. Male brooding. Contrast the position of the male with that of the female while brooding as shown in figure 3.

eral times after this he ate one himself. The female on the contrary was never observed to eat one of them, but fed a number to the young from the ones by the nest. The piece of cherry was also placed by the nest to see what the birds would do with it. The male happened to be the first to visit the nest and, after picking at it several times, gave it to one of the nestlings. Most of the beetles were May beetles, and the larvæ were practically all of this form. The unknown insects and worms were of various kinds and were either so badly crushed as to be unrecognizable or else were of a species unfamiliar to those in the blind at that time.

On June 26, about 4 o'clock in the afternoon, it was decided to make an effort to determine the quantity of food received by each nestling, and to that end a colored thread was tied on the leg of each. By frequently observing the position of the young birds in the nest, the color of the leg band, and paying close attention to the changes in position, it was possible to get a record of the food each nestling received. The colors were green, orange, blue, and white, and each nestling will hereafter be designated by the color of the leg band. Green was by far the most enterprising of the four and left the nest several hours before any of the others, and almost a day before Blue, who was the weakest and most sluggish of all.

From June 26 at 4:11 p. m., until Green left the nest on the 28th, at 12:19 p. m., he was fed 152 times; Orange 142 times; White 169 times; and Blue 133 times. Orange was a small and active bird; White was large and inactive, but seemingly possessed of plenty of strength; Blue was weak and timid. White stayed in the nest until almost the time Blue left, but this was due more perhaps to his inactive disposition than to inability to go. During the period of observation, White was fed a total of 205 times before leaving the nest, and Blue only 163 times in the same period.

TABLE IV. AMOUNT OF FOOD EACH YOUNG BIRD RECEIVED

	GREEN				ORANGE				WHITE					BLUE				
DATE: June	26	27	28	*Total*	26	27	28	*Total*	26	27	28	29	*Total*	26	27	28	29	*Total*
Insects, unidentified	3	6	3	12		5	9	14		7	6	4	17			5	1	6
Larvae	1	1	2	4	1	1	5	7	1	3	2		6	1	1	1		3
Spiders	1			1			1	1	1	1			2					
Raisins		2	1	3		3		3		1		1	2		4	1		5
Worms, unidentified	1	3	1	5		2		2	1	1			2	1		1		2
Earthworms	2	3		5					1				1				1	1
Wireworms		1	3	4			1	1		4			4					
Ants		3		3		5		5			3		3		2	4		6
Caterpillars	1			1		1		1			1		1					
Flies										1			1					
Damselflies							1	1		1	1		2					
Dragonflies	1	5		6	1	2		3		2			2	1	1	1		3
Butterflies						1		1			1		1					
Crickets		1	1	2											1			1
Green Worms															2			2
Cutworms	5	5	4	14	6	13	3	22	6	18	4		28	3	7	7		17
Moths		50	11	61		22	13	35	2	31	11	4	48	1	33	17	1	52
Mayflies	7	16	57	80	9	17	54	80	21	23	75	10	129	15	14	58	3	90
Beetles	2	3	2	7	2	3	1	6		4	2	3	9	2	2	3		7
Grasshoppers	2	23	10	35	3	16	17	36		22	14	2	38	4	17	12	2	35
Daily Totals	26	122	95	243	22	91	106	219	33	119	120	24	296	28	84	110	8	230

Total of Orange to time Green left the nest, 200. Total of White to time Green left the nest, 246. Total of Blue to time Green left the nest, 189.

In Table IV it will be seen that, up to the time Green left the nest, the nestlings had received insects as follows: Green 243, Orange 200, White 246, and Blue 189. When one considers that this distribution extended over parts of three days, it will be seen that the parents did well in dividing it up so evenly. The total amount distriubted was 978 insects, or an average of 219 to each young bird. Green and White received slightly over the average, and Orange slightly less. Blue was 30 below the average, but as already stated, he was neither as active nor as large as the others, and possibly this may have had something to do with the result.

Nothing definite was determined, nor could it be expected in so short a series of observations, as to the method of apportioning the food. A number of throats were sometimes tried before the food was finally given to one of the young, but usually this could be attributed to the insect, or insects, being so large they could not be swallowed. When this happened the parent bird would take the insect to some convenient perch and pound it up till it was small enough for the young to swallow. Sometimes it seemed as if chance determined which individual would receive the morsel, and at other times it looked as if there were other factors. There seemed to be a tendency to feed the one nearest the parent bird, and, as the old birds almost invariably approached the nest from the south, it would follow that the nestling on that side would get the most food. However that may be, the young were constantly trying to get to that side of the nest. One would no sooner get into place on that side than another would crowd him out. This was not always the case, for at times the parents would reach over and feed those on the farther side. Again it seemed as if the nestling that made the greatest disturbance received the food. The old birds, the first day or two, of observation, on approaching the nest and finding that the young made no response, would utter a quick "kek" and every head would instantly come up. After a day or two this was not necessary, as the mouths would all be open before the parents reached the nest.

Tables were also prepared to show the difference, if any, in the character of the food procured by the two parents. It was found that practically the same variety was brought by each one. The male brought centipedes on two different occasions; and raisins, flies, and dragon flies were brought by the female and never by the male.

Sanitation.

In the sanitation of the nest the birds were scrupulously clean. The excreta was seized by one of the parents before it touched the nest, except on two occasions, and these at the latter end of the nesting period. Three interesting facts were noted in connection with the passage of the excreta: viz., the young birds made no attempt to void the excreta except when one of the parent birds was present; second, only one of the nestlings voided the excreta at any one visit of the parent birds; and third, almost always the bird fed, or if two were fed, one of the two voided the excreta. The following table will show this latter fact. The data for this table covers only the last two days and a half of observation, as no means of distinguishing the birds was used until that time:

TABLE V.

Showing the relation of feeding and the passage of excreta.

Date.	Excreta from same bird as fed.	From some other bird.	Total.
June 26	12	5	17
June 27	54	2	56
June 28	35	1	36
June 29	3	0	3
Totals	104	8	112

The results of these observations seem to indicate that the feeding may possibly be the direct stimulus to the voiding of the excreta, as out of a possible 112 times 104 sacs of excreta were removed from the nestling receiving the food at that visit, while only eight were removed from different birds. The parents always stopped a few seconds after feeding, pos-

Figure 5. Male removing the excreta from one of the nestlings.

sibly waiting for the appearance of an excreta sac. In the case of the nestling voiding the excreta, there were usually some premonitory signs: viz., general uneasiness, ruffling the feathers, and flirting the tail. Then followed the elevating of the posterior end of the body, and as the sac came away the parent bird seized it and either devoured it or carried it away. See Figure 5.

In regard to disposing of the excreta there did not seem to be any constant behavior. During the first four days of observation, the most of it was devoured by the parents at the nest or carried a short distance and swallowed. The following table will show the total number of times the nest was cleaned. It will be seen from this table that the work of sanitation was about equally divided between the male and female. Compare Table VI with Table VII, which shows the number of times the excreta was devoured by each of the parents:

TABLE VI.

Total number of times the nest was cleaned.

Date.	By male.	By female.	Total.
June 23	9	3	12
June 24	5	4	9
June 26	20	14	34
June 27	18	38	56
June 28	18	18	36
June 29	0	3	3
Total	70	80	150

TABLE VII.

Number of times the excreta was devoured.

Date.	By male.	By female.	Total.
June 23	9	3	12
June 24	4	3	7
June 26	1	3	4
June 27	3	5	8
June 28	1	0	1
June 29	0	0	0
Total	18	14	32

A study of this table will show that on the first day, out of a total of twelve times the nest was cleaned, the excreta was devoured every time; on the second day, June 24, seven out of nine sacs were devoured; on the 26th only four out of thirty-four were devoured; on the 27th, eight out of fifty-six; and on the 28th, one out of thirty-six. On the 29th, only two birds were in the nest, and that only for a short time. This would seem to indicate that the period of devouring the excreta came to an end on the 25th and 26th, for while on the 27th the total number of sacs devoured was as large as on the 24th, yet in proportion to the total it was much smaller. It would seem then that about the eighth or ninth day the old birds ceased devouring the excreta and commenced to carry it away. There were several occasions when the sac broke in the bird's beak; when this happened, the old bird devoured the piece retained in the mouth, then picked up the other and flew away with it. These were not counted in the table relating to the devouring of the excreta, as there was no way of determining whether or not it would have been devoured if it had not broken. When the excreta was carried from the nest there were several distinct modes of procedure. Several times the parent bird flew to a branch in an oak about twenty feet from the nest and then dropped the sac after alighting; occasionally it was dropped just before the perch was reached; at other times it was carried to the perch and then devoured, the beak being wiped on the limb afterwards. While not universally true, the excreta was generally carried to one of three oak trees in the vicinity of the nest and either devoured or dropped. An attempt was made to determine whether there was any periodicity in the voiding of the excreta, but the results were not conclusive. The intervals in each young bird varied from two minutes to over five hours in length, with a majority of intervals from one to one and a quarter hours in duration. The four nestlings seemed to get equal attention in this particular: Green was attended 27 times; White 38 times; Blue 25 times; and Orange 22 times. White and Blue were in the nest about

twenty-four hours after Green left, and about fifteen hours after Orange left. Blue, during the time the others were in the nest, received the least attention; the excreta being removed from him only twenty times up to the time of Green's departure. White received the most attention, thirty-four times in the same period, while Orange was attended twenty-one times.

Departure of the Young.

At about noon, June 28, the young birds became very restless, especially Green and Orange. They were continually crawling out of the nest and back again. At 12:20 p. m. Green crawled out of the nest and sat chirping for a short time. He then spread his wings and made an attempt to fly, but only succeeded in going a few inches. Immediately on falling he commenced to hop rapidly away; stopping a short interval at a fence about ten feet distant. One of the old birds returned at this time and coaxed him along until he reached the top of a little hill some sixty yards away. Here he stayed for some time, being fed at intervals by the old birds. One of the parents was with him most of the time from now on. From the time he left until 2:40 the female never visited the nest, and when she returned, the male went away and came back only once the rest of the afternoon.

At 2:10, Orange left the nest in much the same way. The male went with him and by coaxing him a short way at a time soon had the second nestling on the little knoll occupied by Green. The male busied himself the rest of the day caring for these two while the female fed White and Blue in the nest.

The next morning White started away at 7:07 and was coaxed along by the female for about thirty yards. Blue remained alone in the nest until 7:45, being fed only once in the interval, though White was fed three times. 7:45 Blue left the nest, but no parent bird returned to aid in the journey as long as the observations were continued. At 8:15, when the observations ceased, Blue was still alone in the grass.

Later all four of the fledglings were found in the ravine near by. They were noticed here several times, July 25 being the latest date on which they were positively identified. At this time the strings were still on their legs, but were so faded that no particular color could be recognized.

Sioux City, Iowa.

Figure 6. Female inspecting the nest. The white spot on the head is faintly visible.

A STUDY OF THE AVIFAUNA OF THE LAKE ERIE ISLANDS.

(With Particular Reference to the Migration Phenomena.)

BY LYNDS JONES.

(Continued from page 18.)

The summer study on Pelee Island in 1910 began on July 16, when two men, accompanied by their wives, landed at the camping ground on Fishing Point among the red cedars. Except for one visit of a night and a day to oversee the work on the part of the writer, these two men continued the work without other assistance for two weeks, at the end of which time the remainder of the company reached the island. The entire company was composed of nine men and two women and the teacher. The two men and their wives left on August 26, and on September 2 one of the remaining men was taken to a hospital in Sandusky. On this same day two other men came to our camp and remained with us until our final departure on the 7th of September. While these two men were visitors they assisted in the work. It will be seen that the work began early enough to make a thorough study of the avian conditions of the island before the migrations began, thus affording interesting studies of the ecological conditions of the summer resident birds, and furnishing means of comparison between the summer status and the conditions during the migrations.

It must be understood that there was no such intensive study of the island as a whole as was made of the Fishing Point and its immediate environs, but enough study of the whole island was made to give a fair idea of the conditions as far as the bird life is concerned.

Quite contrary to what we had been led to suppose, Pelee Island is by no means one big marsh bordered by a lake beach all around. Nearly the whole southern fifth of the island is high ground underlaid by lime rock, presumably of the Niagara formation. A somewhat

rounded area one mile in width by nearly a mile and a half in length of similar high ground underlaid by stone occupies the eastern side, a little north of the middle, and an area of about half the dimensions occupies the middle and base of the north-eastern point, while a larger area forms the north-western point, extending also to the middle of the North Bay, and down the west shore nearly two miles. The interior, which is more than half surrounded by these high limestone areas, was once a marsh, but all of it has been drained out and is cropped every summer. The staple crop is tobacco — the same kind that is raised in Kentucky. Corn, oats, wheat, and potatoes are also grown. The only swamps upon the island now are a somewhat extensive one which occupies the north end of Light House Point. This covers an area rather less than 500 acres. There is a smaller marsh bordering the middle of South Bay, and one of perhaps thirty acres on the east side of the base of Fishing Point. There is also a very small muck swamp, of much less than an acre, on the west side of Mosquito Point. Thus the conditions which prevail on this island are now quite dissimilar from those on Point Pelee as reported by Taverner and Swales.*

Of course Fishing Point runs out into the lake much as the extreme point of Point Pelee does, and conditions here are the same. It might be said, however, that conditions on Fishing Point are much nearer primitive than is the southern end of Point Pelee. Fishing Point contains no dwellings, and the single narrow road is almost no disturbance to the forest. We were told that in the earlier days the island was densely wooded with red cedars. There is still evidence that the higher areas were covered by deciduous forests.

That Fishing Point is gradually being shifted west there is abundant evidence in the cutting away of the east beach and the building up of the west beach, as well as the submerged roots and stumps of huge trees now rods from the east beach. Every year witnesses the overthrow of trees, some of them of more than a foot in diameter, on the east

* Wilson Bulletin 19, p. 39 *et seq.*

side of the Point, and the self-planting of trees on the west side. The series of parallel ridges are parallel to the west side, but not to the east side.

Asummary of the work done follows in the language of two of the students, supplemented later by a list of the birds and their dates of occurrence. These reports undertake to give a brief survey of the more prominent ecological features that have some bearing upon the distribution of the birds.

REPORT ON THE ECOLOGY OF PELEE ISLAND, SUMMER OF 1910.

Part I.

BIRD CONDITIONS BEFORE THE BEGINNING OF MIGRATIONS.

Before the beginning of the migrations the birds were divided into four distinct groups ecologically; one of which has several further subdivisions. These are the birds found in the woods on the point, the marsh birds, the water and beach birds, and the birds found inland, mostly about cultivated fields or small woodlots.

Under the first group, that of the woods birds, there are three subdivisions, the birds of the cedars, the birds of the deciduous belt, and the birds that frequented both indiscriminately.

The birds found distinctively among cedars were the Screech Owl, Cardinal, Cedar Waxwing, Pine Warbler, and Brown Thrasher. Of these Cardinal, Cedar Waxwing, and Thrasher deserve especial mention because of their great abundance, especially considering the northern locality. The Pine Warbler must have nested there, which is a good record. The Screech Owl was probably seen only in the cedars because we were there most after dark.

Of the birds seen only in the deciduous belt, the Hairy, Downy and Red-headed Woodpeckers stayed among the tall trees with dead tops, found at the base of the point. The Blue Jay, Warbling Vireo and Crested Flycatcher, as well as the Black-billed Cuckoo, also stayed in these tall trees, among the dense foliage. The Towhee and Catbird stayed in the

dense thickets south and west of the marsh, while the Woodcock frequented the damp woods west of the marsh. The Wood Pewee, Northern Yellow-throat and Redstart stayed mostly in the lower deciduous trees on the point itself.

The Mourning Dove, Yellow-billed Cuckoo, Flicker and Crow were found indiscriminately in the woods and in about their usual numbers. The Robin, Bronzed Grackle, Song Sparrow and Baltimore Oriole were present indiscriminately, but in smaller numbers than is usual on the Ohio shore. The Carolina Wren was also present in small numbers, which is unusual for so northern a locality. The Kingbird, Orchard Oriole, Indigo Bunting and Red-eyed Vireo were present in unusual abundance, especially the two last mentioned.

The Marsh birds, which had presumably bred in the swamp on the island, were the Wood Duck and Blue-winged Teal, the Least and American Bitterns, the Green and Great Blue Herons, the King, Virginia and Sora Rails, the Florida Gallinule, the Short-eared Owl, Belted Kingfisher, Phoebe, Alder Flycatcher, Red-wing, and Long-billed Marsh Wren. Yellow Warblers and Louisiana Water-Thrushes may also have nested here. The Black Terns nest in swamps, but at the time of our visit were plainly beach birds. They probably do not nest on the island.

The birds found flying over the water and lighting on the beach were the Herring Gull, Common and Black Terns, Spotted Sandpiper, and Killdeer. The Belted Kingfisher divided his time about equally between the beach and the swamp. Some Common Terns were still nesting on Middle Island and the Hen and Chicken group, but most of the gulls and terns were through nesting, and gathered on the end of the sandspit in immense numbers, standing there much of the day. The Black Terns were in the curious mottled, molting plumage very largely.

In the pastures and cultivated fields inland were some species, such as the Bobolink, Meadowlark, Vesper and Field Sparrows and Migrant Shrike, which never came upon the point. Around the houses and orchards were a few House

Wrens and Bluebirds, although they were much less common than in Ohio. In the bits of woodland and in great trees left in the open fields were the nests of Bald Eagles, and Red-shouldered and Red-tailed Hawks, and Great Horned Owls were also found in the woods.

Part II.

MIGRATION CONDITIONS.

During the migrations there were four, or possibly five, different groups. Some worked south by stages, resting at night in the swamps, others followed the beach, or flew out over the water, some flew right out the point from base to tip, either continuing their flight all the way, or lighting in the trees occasionally to rest; but by far the greatest number of birds worked along gradually through the woods, only starting in their flight when they reached the limit of shrubby vegetation. These are the birds that cannot often be seen in the act of migrating, and which Pelee Island is especially suited to catch in the act.

The Swamp-frequenting migrants were the Pied-billed Grebe, Mallard, Coot and Black Duck, where there was open water; the Wilson's Snipe, Yellow-legs, and Solitary Sandpiper on the mudflats. The Least, Semipalmated, Baird's and Spotted Sandpiper and the Killdeer and Semipalmated Plovers occasionally visited the mudflats, although usually staying on the beach. The Little Blue Heron, a straggler from the south, may as well be mentioned here. Its occurrence so far north is rare, but not unprecedented. The Rails and Herons were probably migrating, but we could not detect their movement with certainty.

Over the water migrated the Bonaparte Gull and Caspian Tern, and along the beach came a host of shore-birds. The Dowitcher, Knot, Baird Sandpiper, Hudsonian Godwit, and Black-bellied Plover were some rarities that were seen; the Baird Sandpiper in considerable numbers. The Least, Semipalmated, and Spotted Sandpiper, the Sanderling, the Ruddy Turnstone, and the Piping, Semipalmated and Killdeer Plo-

vers were all seen in unusual numbers. Only the Pectoral and Red-backed Sandpipers were seen more rarely than might have been expected.

Of the birds that flew over the trees, the Swallows and Blackbirds were easily the most noticeable, the former flying in loose aggregations, the latter in compact flocks. The Swallow bands were usually composed of all the species, but with a decided predominance of one or two kinds. At first the commonest were the Rough-winged, but soon the Bank also became prominent, only to be outnumbered in turn by the Purple Martin. The Barn Swallows were always present in good numbers, but the Tree and Cliff Swallows, while usually present, were never seen in large numbers. The Swallows migrated mostly before 9:00 a. m. and after 5:00 p. m., but on favorable days a steady stream would be passing from morning until night. Of the Blackbirds, the Bobolinks came past in flocks of Bobolinks alone, ranging in number from twenty-five to three or four hundred. Red-wings, Bronzed Grackles and Cowbirds came in flocks mostly of one species, but containing also some individuals of the other two. Blackbirds (including Bobolinks) were only seen passing in the morning and at night, not in the middle of the day. Once an enormous flock of Grackles was found scattered and feeding around the west end of the swamp. The passing Redwings also often paused at the swamp. After passing the base of the point, however, they did not usually light again.

The Swallows were usually accompanied by a few Chimney Swifts; and Nighthawks, Ospreys and Marsh Hawks were also seen migrating, flying usually high in the air. The Marsh Hawks seemed to migrate usually in pairs.

The Goldfinch, Rose-breasted Grosbeak and Bluebird migrated singly or in small companies, and lit, here and there, in the trees to rest. They act much like the Bluebirds, but light more. The Mourning Dove, Flicker, Red-headed Woodpecker, and Kingbird traveled in small, loose, companies, which in the case of the last mentioned, almost reach the dignity of flocks sometimes. They light even more than the

Goldfinches and Bluebirds, almost always stopping to rest and discuss the matter before starting out for the crossing to Middle Island. The Sharp-shinned Hawk and Goshawk hang on the skirts of the great warbler and thrush flocks, taking their toll of victims, and necessarily lighting to devour them. The Ruby-throated Hummingbird does not really light, but is mentioned here because of its habit of stopping to hover in front of a primrose blossom before speeding on close to the sand and off over the water.

Of the birds that worked out through the woods there are three groups, the flycatchers, the thrushes, and the warblers. The Purple Finch, House Wren, Blue-gray Gnatcatcher and Red-breasted Nuthatch also came down the point in this way. The Red-breasted Nuthatches and Blue-gray Gnatcatchers seemed to prefer the cedars to the deciduous trees. The Thrushes were satisfied with anything that kept them well concealed and out of sight. The Flycatchers had no choice, as far as I could see. The little red dragonflies (Sympetrum rubicundulum) that formed a large part of their food, were equally numerous everywhere. Early in the season, the warblers seemed to prefer the red oaks, usually surrounded by cedars, but later they were perhaps crowded out into the cedars, for they often left the oaks empty, while the cedars near by were full. In the great jams, the cedars and oaks alike were packed with birds. The warblers seemed to eat mostly small spiders and beetles, which they gleaned from the branches.

Of the flycatchers, the Olive-sided kept mostly to certain favorite tall, dead tree-tops, just south of the swamp. Occasionally we could get a look at one with the shining flank feathers over the wing, making a most striking field-mark. The Least, Acadian, and Yellow-bellied Flycatchers were all exceedingly numerous, especially the first. They were found everywhere, throughout both cedar and deciduous belts.

The Wood, Wilson, and Olive-backed Thrushes arrived just as we were about to leave. They kept so closely to the underbrush a satisfactory identification was extremely difficult.

The fall warblers were present in almost unbelievable numbers. The Golden-winged, Cape May, Pine, Palm, Prairie, and Connecticut Warblers and the Water-Thrush were species, usually rare, that were seen there in numbers, the Cape May and Water-Thrush being exceedingly abundant on some days. The commonest of the warblers were the Cape May, Black and White, Magnolia, Bay-breasted, Blackburnian, Black-throated Green, and Redstart. All these were exceedingly abundant at some time. On the big warbler days, all of the species just mentioned, together with the Water-Thrush, Louisiana Water-Thrush, Nashville, Tennessee, Black-throated Blue, Cerulean, Chestnut-sided, Black-poll, and Canadian deserved a better mark than "common." The Blue-winged, Golden-winged, Pine, Palm, Prairie, Connecticut, Mourning, Wilson, and Oven-bird were seen time after time. Almost every day these warblers were all present except the extreme rarities, and almost all of them were seen in every plumage, from the full adult to the most disguised youngster. It was a chance to study fall warblers that none of us will ever see the like of again, and we certainly improved it.

In all, 138 kinds of birds were seen on the island. Of these, 85 breed in the latitude, and may be considered as summer residents, 51 are clearly migrants and 2, the Little Blue Heron and Goshawk, are stragglers.

Part III.

MAMMALS OF THE ISLAND.

The only mammals seen were the cotton-tail rabbit, the black and fox squirrels, and the deer or white-footed mouse. It is peculiar that no grey squirrels were seen. Mr. Ackley reported seeing one, however, and perhaps it was due to our lack of observation. The black squirrels were very large and fine specimens. One fox squirrel was found far out on the point, where there was nothing but small shrubs, and killed with a stick. Its presence there was probably due to sympa-

thetic migration. There were signs of muskrats, but the animals themselves were not seen.

Part IV.

REPTILES AND AMPHIBIANS.

Blanding's Turtle was the only turtle found in the marsh on the point. Snapping turtles and Margined Turtles (Chrysemys marginata) were found in the canals on the island.

The American Toad and Pickerin's Tree-frog were fairly numerous away from the water, and in the swamp were the Leopard Frog and Bullfrog.

In the lake, swimming around, and occasionally ashore, were found both the common Watersnake (Natrix fasciata sipedon) and the Red-bellied Watersnake (Natrix fasciata erythrogaster). Along the shore and among the cedars were found the Puffing Adder (Heterodon platyrhinus), the Milk Snake (Osceola doliata triangula) and the Garter Snake (Eutania sirtalis sirtalis). Toward the base of the point was found a Black Snake (Bascanion constrictor). In the heavy deciduous timber, climbing the trees, were found several Pilot Snakes (Coluber obsoletus obsoletus). One was brought to my attention by a troop of about fifty warblers, which had gathered about one in a tree about sixty feet high. One of these was the largest snake we killed, measuring five feet and three inches in length.

Part V.

LEPIDOPTERA—BUTTERFLIES.

Anosia plexippus. Monarch.—Common everywhere. Seen migrating and resting in large flocks.

Papilio cresphontes. Giant Swallowtail.—Common among the trees on the point. Seen migrating with A. plexippus.

Papilio asterias. Eastern Swallowtail.—Common.

Papilio turnus. Yellow Swallowtail.—Fairly common on point.

Papilio troilus. Spice-bush Swallowtail.—Common. Seen migrating with A. plexippus.

Pieris rapae. Cabbage Butterfly.—Common. Seen migrating

Colias philodice. Clouded Sulphur.—Common inland. Seen migrating.

Grapa interrogationis. Question sign. — Common, especially at the kitchen garbage hole.

Grapta comma. Comma. — Common, especially at the kitchen garbage hole.

Pyrameis atlanta. Red Admiral.—Fairly common. Migrated in small flocks by itself.

Vanessa antiopa. Mourning-cloak.—Fairly common around camp.

Argynnis aphrodite. Aphrodite Fritillary. Common on Milkweed and Loosestrife flowers, around the swamp.

Brenthis bellona. Meadow Fritillary.—Fairly common inland.

Phyciodes tharos. Pearl-spot.—Common everywhere.

Lycaena sp. Little Blue.—Common in places inland.

FRANCIS M. ROOT.

Fishing Point of Pelee Island proved to be an excellent place for fall bird study. Within a range of three miles there were suitable feeding grounds for all kinds of birds — sandy beaches, rocky ledges, open water, heavy woods, both deciduous and coniferous, open fields, bushy pasturelands and swamps with heavy undergrowth, cat-tails, mud flats and open water.

The summer birds offered no especial peculiarities. The absence or at least rarity of the Wood Thrush, Warbling Vireo, Oven-bird, White-breasted Nuthatch, and Chickadee was noticeable. Cardinals were common, although it was the northern extremity of their range. Eagles seemed to thrive on the island despite the fact that they were shot with impuity. At least ten individuals were seen.

The migrations brought many rarities, especially in the line

of shore birds. The records for the Dowitcher, Knot, Baird Sandpiper, Hudsonian Godwit, Black-bellied Plover, Caspian Tern, Piping Plover, and Little Blue Heron show that the water and shore birds of Lake Erie have not yet been exhaustively studied. Among other unusual records were the Olive-sided Flycatcher, Goshawk, Golden-winged Warbler, Connecticut Warbler, and Blue-winged Warbler. The Cape May Warblers were almost abundant and were common about Oberlin on the 17th of September.

There were three big migratory waves. The first occurred on August 12, and consisted almost wholly of Swallows. About 8000 passed over.

The second wave was on August 27. Besides bringing many swallows and bobolinks, the first batch of warblers arrived. The Redstarts were predominant. The warblers stayed almost entirely in the deciduous trees at the base of the spit.

The third and biggest migration reached its height on September 1, and lasted through the third. On the morning of the first all living beings seemed unduly excited. Butterflies, squirrels, and rabbits, as well as all kinds of birds, worked down towards the end of the spit. Almost no birds were to be seen around the swamp. The movement continued through the next two days, but on the fifth almost everything had left. During this movement the following migrating birds were common: Bobolink, Purple Martin, Least Flycatcher, Red-headed Woodpecker, Black and White Warbler, Blackburnian Warbler, Bay-breasted Warbler, Wilson Warbler, Red-breasted Nuthatch, Chestnut-sided Warbler, Black-poll Warbler, Magnolia Warbler, Wilson Thrush, Olive-backed Thrush, Cape May Warbler, Black-throated Green Warbler, Black-throated Blue Warbler, Oven-bird, Water-Thrush, Louisiana Water-Thrush, and Nighthawk.

The food of the birds while on the spit was not accurately determined. The sandpipers and plovers ate lakeflies and their skins, washed up on the beaches. The redstarts were eating common flies most of the time, while in the cedars all

the warblers lived on insects. They did not touch the cedar nor dogwood berries, but did eat grapes at times.

The warblers always kept on the side of the point most protected from the wind. In those localities where there was an abundance of both cedars and deciduous trees the warblers seemed to shift back and forth between the oaks and the cedars indiscriminately. The red and chestnut oaks were by far the most popular of the deciduous trees, although the sycamores and sugar maples were favored. Warblers could almost always be found in the willows and button-bushes about the swamp. They were rarely found in ash trees.

The vegetation of the point was very peculiar. It had the general southern aspect of all Lake Erie sandspits, but was lacking in those prime features, the cottonwoods and willows. Among the plants which we do not find commonly about Oberlin were the hackberry, chestnut oak, arrow-wood, snowberry, sweet-scented sumach, wafer ash, red cedar, common juniper, western prickly pear, red ash, blue ash, green ash, and red bearberry. The absence of the chestnut, beech, hornbeam, horse chestnut, and smooth sumach were noticeable.

WOODY PLANTS ON FISHING POINT.

Red Maple.—Common at extreme base.
White Maple.—Common at extreme base.
Sugar Maple.—Abundant in the deciduous belt.
Hackberry.—Common in the deciduous belt.
White Ash.—Fairly common, except among the cedars.
Black Ash.—?—in the deciduous belt.
Green Ash.—Common in the deciduous belt.
Red Ash.—Fairly common, except among the cedars.
Blue Ash.—Common, except among the cedars.
Honey Locust.—Uncommon.
Black Walnut.—A few on the east shore.
Red Cedar.—Abundant.
Red Mulberry.—Scattered.
Hop Hornbeam.—Common.
Sycamore.—Fairly common.

Cottonwood.—Bunch on beach east of swamp.
Large-toothed Aspen.—A few on west shore.
Quaking Aspen.—A few on west shore.
Sand Cherry.—Fairly common on west shore.
Choke-cherry.—Fairly common on west shore.
Red Oak.—Abundant in deciduous belt.
Chestnut Oak.—Abundant in deciduous belt.
Basswood.—Common in deciduous belt.
White Elm.—Common in deciduous belt.
Swamp White Oak.—Common north of swamp.
Willow.—Three varieties, mostly on west shore.
Slippery Elm.—A few on end of point.
Sheep-berry.—Scattered through deciduous belt.
Arrowwood.—Fairly common in deciduous belt.
Gooseberry.—Fairly common in deciduous belt.
Hickory.—Fairly common on west beach.
Snowberry.—Fairly common in cedar belt.
Elder.—Fairly common about swamp.
Thorn.—Two varieties, north of swamp.
Sweet-scented Sumach.—Abundant.
Staghorn Sumach.—Abundant south of swamp; common elsewhere.
Poison Ivy.—Common, except in cedar belt.
Raspberry.—Fairly common.
Woodbine.—Scattered.
Wafer Ash.—Abundant on west beach.
Common Juniper.—Common in cedar belt.
Western Prickly Pear.—Common in cedar belt.
Red Bearberry.—Fairly common in cedar belt.
Smooth Honeysuckle.—A few near end of point.
Perfoliate Honeysuckle.—A few near end of point.
Kinnikinnik.—Fairly common on west beach.
Rough-leaved Dogwood.—Common.
Shrubby Bittersweet.—Scattered through deciduous belt.
Buttonbush.—Abundant in swamp.
Swamp Rose.—Common in swamp (?).
Early Wild Rose.—Fairly common (?).

Glossy Rose.—Scattered (?).
Sweetbrier.—Scattered.
Wild Grape.—Abundant.
Greenbrier.—Common in deciduous belt.
Virginia Creeper.
Dodder.
Running Euonyms.
Wild Clematis.
Trumpet Vine.

ONCE UNDER CULTIVATION.

Apple. Peach.

T. N. METCALF.

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Editorial

We are pleased to note that the revised edition of Mr. Frank M. Chapman's "Handbook of the Birds of Eastern North America" is ready for distribution. It is undoubtedly true that the first edition of this unexcelled book has exerted a greater influence than any other book upon the people of this country and therefore is the direct cause of the awakened public interest in birds. The enlargement and improvement of the present edition should continue this good work.

—o—

What has happened to the Robins and Bluebirds? While there are still many Robins throughout the country, it is clear that there are fewer than usual. Bluebirds are still present, but in such diminished numbers that it is common remark that there are almost none. Robins in large numbers spent the excessively cold winter in the south-

ern and eastern parts of Ohio, and it was stated in local papers that many were frozen or starved to death during the latter part of March. It seems probable that a like fate overtook many of the Bluebirds.

———o———

The cold winter, followed by a late spring in the central districts and the promise of a cool summer, are likely to result in a temporary pushing south of the breeding ranges of birds in the lower lake region where there appears to be some instability as to certain breeding birds. At the present writing (June 5) Olive-backed Thrushes are still present and singing at Oberlin — an unprecedentedly late date. It is not likely that this species will breed here even this summer, but it may be indicative of an inclination on the part of birds like the White-throated Sparrow, Black-throated Green Warbler, Black-poll Warbler, and others to remain to breed, contrary to their usual custom. A careful scrutiny of the summer fauna will not be amiss in any region.

———o———

The paper dealing with the detailed study of a Brown Thrasher's nest, the first article in this number, is another of the carefully worked out studies of that part of the life history of a species which is greatly needed in our intimate studies of the birds as a means of a thorough understanding of their place in nature. It is needless to say that the paper represents an amount of painstaking work which no one who has not undertaken something of the kind can begin to appreciate. It may be objected that the printing of the details of each of the 775 visits of the parents to the young is uncalled for; but we would remind the possible objector that this is pioneer work and details are necessary for the laying of a sure foundation for the further work which we earnestly hope may follow this work.

General Notes

NEW JERSEY NOTES.

DECEMBER BIRDS IN NORTHERN NEW JERSEY.—On December 24, 1911, while making a sectional census in several northern New Jersey towns, seventeen species of birds were located, and of which four hundred and fourteen individuals were recorded.

The towns passed through in making this census included Caldwell (Essex County), Pine Brook, Horse Neck, Towace, Lincoln Park, and Mountain View (Morris County), a distance of fifteen and one-half miles of much diversified country, and over a period of five and one-half hours. The weather throughout the day was rather warm and very humid and the sky overcast with heavy storm clouds. The species observed were: Flicker (2), Junco (32), Song Sparrow (3), Blue Jay (21), Tree Sparrow (29), White-breasted Nuthatch (5), Downy Woodpecker (3), Herring Gull (1), Starling (25), Chickadee (5), Crow (130), Meadowlark (4), Brown Creeper (2), Goldfinch (79), Tufted Titmouse (17), Bluebird (5), and Myrtle Warbler (1).

In addition to the above records, the following were observed prior to the above date: Sparrow Hawk, Golden-crowned Kinglet, Robin, White-throated Sparrow, Kingfisher, Sharp-shinned Hawk, Fox Sparrow, Marsh Hawk, and Barred Owl. These latter added to those observed on the 24th makes a total of twenty-six species for the month, which is, indeed, a fair list for this portion of New Jersey.

DUCK HAWKS ON NEWARK MEADOWS AND VICINITY.—During the past winter Duck Hawks (Falco peregrinus anatum) have been unusally common on the Newark Meadows and vicinity. They were observed near the Plank Road and Passaic River Bridge on January 29th, February 20th and 24th, 1912.

Prior to the above dates I have found this bird only twice before in northern New Jersey. Both of the former records were made at Greenwood Lake on November 3, 1907, and February 6, 1910.

HERMIT THRUSH IN PASSAIC COUNTY, N. J.—On May 27, 1910, a completed nest of this species was located among the low hills of West Milford Township, near the Orange County Line, in a low laurel bush about six inches from the ground and contained a clutch of four eggs, bluish green in color. The nest was composed of bark, grasses and pieces of grape-vines and lined with fine roots and grasses, deeply cupped and compactly formed. On June 10th,

I again visited this nest and found both parents assiduously caring for the young, which appeared about five days old.

As far as I can learn this is the only nest of this species which has been found in New Jersey up to this time. On a number of occasions during the past seven years, while in this neighborhood, I have found the Hermits here during the summer months, but up to the above date never located the least indications of their breeding and rearing young here. There are many Wilson Thrushes present here throughout the late spring and summer months also, but have never found them nesting here.

EARLY TREE SWALLOWS.—On March 30, 1912, a pair of Tree Swallows were seen circling about over the Newark Meadows near Harrison, N. J., for over a half hour. This is the earliest date this bird has been observed so far north in New Jersey during the past decade. The birds appeared perfectly contented, and when they left, they were headed in a northerly direction towards the Hackensack Meadows.

APRIL BIRD NOTES.—At Pompton Lakes, in northern New Jersey, on the 13th and 14th of April, 1912, I found numerous birds which, from previous observations in this locality, would appear of unusual interest and worthy of more than passing notice, and below is appended an annotated list of the species observed on these days. The 13th was warm and showery and the 14th marked by light misty rains and a slight drop in the temperature.

(1) *Colymbus auritus*—Horned Grebe. A pair of these birds seen on Pompton Lake on the 14th. Both still retained the winter plumage. This is the only record of this bird I have for Passaic County.

(2) *Gavia immer*—Loon. One female was found diving, swimming and flying about over the lake on the 14th. This is also a new bird for Passaic County. In fact, it is the first record I have for the state.

(3) *Larus argentatus*—Herring Gull. Nine of these were found on and over the lake on the 13th. This is the first of this species to appear in this neighborhood since August 30, 1903. One was observed at Lincoln Park, ten miles to the south, on December 24, 1911.

(4) *Nettion carolinensis*—Green-winged Teal. A male of this species was found on the lake on the morning of the 14th. This also is a first record for Passaic County.

(5) *Zenaidura macroura carolinensis*—Mourning Dove. Six were

seen on the 14th near the Steel Works at the southern end of the lake.

(6) *Pandion haliætus carolinensis* — Osprey. Two were seen diving and fishing in the lake on both days near the upper end.

(7) *Strix varium*—Barred Owl. One male seen on the east shore of the Pequannock River on the 13th.

(8) *Ceryle alcyon*—Belted Kingfisher. Four were seen on the 13th and three on the 14th.

(9) *Dryobates pubescens medianus*—Downy Woodpecker. But one was found on the 14th on the south shore of the lake in a copse of conifers.

(10) *Colaptes auratus luteus*—Flicker. Common on both days throughout the borough.

(11) *Sayornis phœbe*—Phœbe. One was observed on each day.

(12) *Cyanocitta cristata*—Blue Jay. Were seen commonly on the 13th. But three were found on the 14th.

(13) *Corvus brachyrhynchos*—Crow. Common all over the borough on both days.

(14) *Sturnus vulgaris*—Starling. Common on both days in the residential section. Rare in the rural parts.

(15) *Molothrus ater*—Cowbird. Two were found on the 13th and four on the 14th.

(16) *Agelaius phœniceus* — Red-winged Blackbird. Common about the lake on either day.

(17) *Sturnella magna*—Meadowlark. Common on both days, especially in the old stubble fields.

(18) *Carpodacus purpureus*—Purple Finch. One found near the Steel Works on the 14th.

(19) *Quiscalus quiscula*—Purple Grackle. Common on both days throughout the borough.

(20) *Astragalinus tristis*—Goldfinch. Common on the 14th on all sides. None seen on the 13th.

(21) *Pooecetes gramineus*—Vesper Sparrow. But one was seen and heard on the 13th. None on the 14th.

(22) *Zonotrichia albicollis*—White-throated Sparrow. Two were located in a copse of conifers on the south shore of the lake on the 14th.

(23) *Spizella passerina*—Chipping Sparrow. Common on both days, on the roadside especially.

(24) *Spizella pusilla*—Field Sparrow. Common on both days throughout the borough.

(25) *Junco hyemalis*—Slate-colored Junco. Common on both days in the more rural sections.

(26) *Melospiza melodia*—Song Sparrow. Common on both days throughout the section.

(27) *Hirundo erythrogastra*—Barn Swallow. Two were observed in company with the Tree Swallows over the lake on the 14th.

(28) *Iridoprocne bicolor*—Tree Swallow. Six were found on the lake during the morning of the 13th. On the 14th they were common over the lake all day.

(29) *Anthus rubescens*—Pipit. One was seen near the Pequannock River on the 13th.

(30) *Sitta carolinensis*—White-breasted Nuthatch. One found at the Steel Works on the 14th.

(31) *Planesticus migratorius*—Robin. Common on all sides on both days.

(32) *Sialia sialis*. Common on both days throughout the borough.

April 16, 1912. LOUIS S. KOHLER.

BIRDS AND CATS.

The Audubon Society of Massachusetts, a branch of the great national association, of which there are tens of thousands of members in this country, is appealing to the people to assist in the protection of birds by not allowing their cats to roam during the season when young birds are leaving their nests.

In a fruit-growing section like North East, where thousands of dollars worth of apples and other fruits are destroyed every year by insect pests, and where spraying and other measures are imperatively necesessary to hold these pests in check, we need every available bird to pull with us in fighting the noxious insects.

Here in town hundreds of young birds might be saved every spring if those who own cats would not allow them to roam at pleasure during the nesting season.

This is looking at the matter from an economic point of view. There is another view that appeals as strongly to the writer, and that is the pleasure of seeing the wild birds and hearing their cheerful songs.

Many birds come from the woods to town for better protection of themselves, their eggs and their young from the owls, hawks, crows, shrikes, squirrels, skunks, weasels, minks, and last, but not

least, from the boys with guns. The better we protect them the more of them will come.

Since spring shooting of ducks has been prohibited in New York, thousands of ducks winter in waters of the central part of that state. Those that stay north are not limited to the hard-weather kinds, but include those that naturally would go south, were it not for the fact that they prefer to endure the rigor of a northern winter rather than risk their lives by being constantly harassed by the shotgun at the south.

Palm Beach and some other winter resorts in Florida prohibit shooting within a mile of town. Pelicans, ducks and other wild water birds resort to these places and soon become so tame one can approach within a boat's length of some of them.

These instances show that birds are not slow to appreciate efforts in their behalf and to take advantage of them.

Is the reader among those who regret the seeming decrease year by year in the number of birds hereabouts? Do you realize that your cats are feasting on dozens of baby birds each year, and thereby making you partly responsible for such a condition? Birds and cats don't go well together. If you have a cat and don't need one, how would it strike you to open negotiation with some boy to eliminate her? Thereby you would do a commendable act in a good cause.

The birds will soon begin to return from the south. We will enjoy having the wrens, the bluebirds, the flickers, the catbirds, the yellow warblers, the orioles, and other birds that nested on our premises last year come back to us again this spring. We will greet their coming as though it were friends in human form, and will try to make it unpleasant for any of the feline tribe that roam about our garden when the young birds are learning to fly.

North East, Pa., March 20, 1912.

B.

ELECTION OF OFFICERS FOR THE YEAR 1912.

Balloting for Officers for the year 1912 resulted in the selection of W. E. Saunders, London, Ont., for President; Bradshaw H. Swales, Grosse Isle, Mich., for Vice-President; C. W. G. Eifrig, Addison, Ill., for Secretary; W. F. Henninger, New Bremen, Ohio, for Treasurer; Frank L. Burns, Berwyn, Pa., J. H. Fleming, Toronto, Ont., and Lynds Jones, Oberlin, Ohio, for the Executive Council.

For most of the offices the vote was very close.

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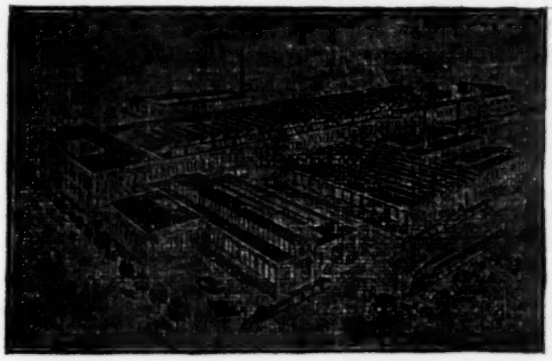

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